COMPUTERWORLD

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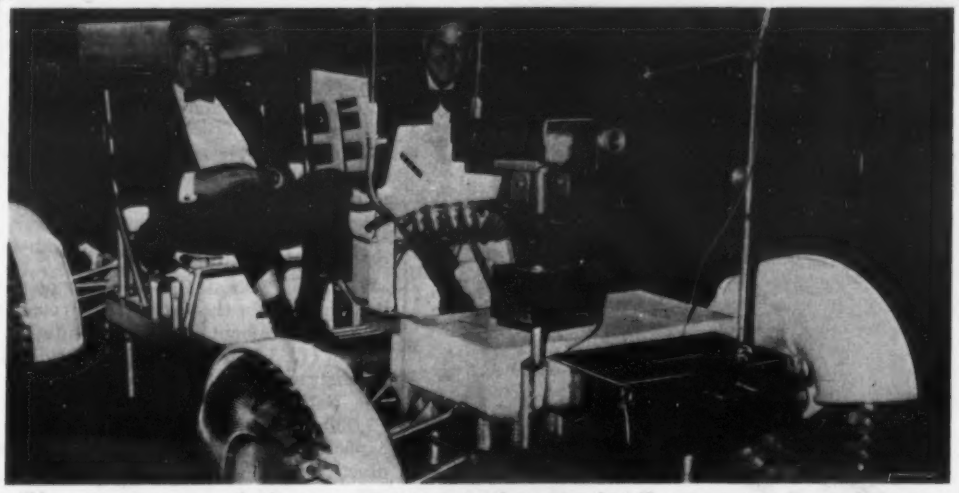


"You can argue over whether you want to go to the moon, but if you want to go, you've got to have a computer to do it." The computer's fathers – John W. Mauchly and J. Presper Eckert, Jr. – in the Lunar Rover.

Eckert and Mauchly Predict

EDP Still Has a Long Way to Go

By Michael Merritt
Of the CW Staff

"Let me tell you what the computer won'd do yet," J. Presper Eckert, 52, said. "It won't recognize patterns decently . . . . We have no machine that will read the whole alphabet in printing, we have no machine that will certainly read hand script, that will understand voice except for a few dozen words, that will recognize faces . . . .

"We have no way of really verifying when a guy goes in a store whether it's really his credit card or not."

Also speaking of the future of computers, John W. Mauchly, 66, said, "We know [computers are] going to get smaller and cheaper. It's part of the economic argument that they've got to get cheaper in order to have wider spread usefulness.

"We used to spend a lot of effort . . . trying to tell everybody that it isn't the speed [of computers] that's important – it's the low cost. Everybody was sort of gaa-gaa over the fact that, 'gee, you can do a million sums a second.'

"Well, a million sums a second, if it costs 10 times as much as it did before, is no victory. But if it can be done at one-tenth the cost, that's something to talk about."

Eniac Builders

Balding, bow-tied J. Presper Eckert Jr. and bearded, professorial John W. Mauchly are the men who invented and built Eniac, generally conceded to be the daddy of all electronic computers.

Both are still involved in data processing, Eckert as a vice-president of Univac, and Mauchly as head of his own company, Dynatrend, which does computer-aided stock market analyses.

On Eniac's 25th birthday, CW interviewed Eckert and Mauchly on the past and future of data processing.

Eckert sees the main social impact of computers in the last 25 years as elimination of human bookkeeping.

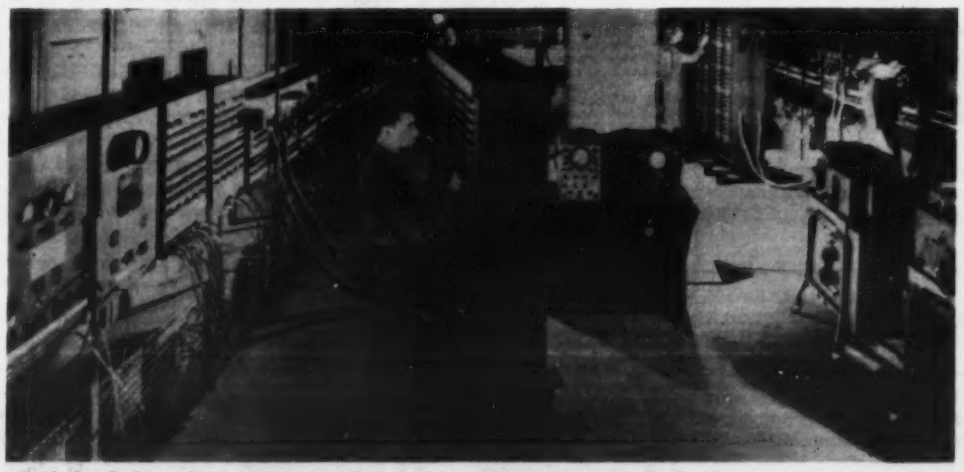
"In 1960," he said, "we reached the point where [it was estimated] half of all our manpower went into clerical work, and the percentage was increasing. Since then it has roughly leveled off.

"It's this leveling off, this lack of effect, that has been the most significant aspect of data processing on society."

Eniac began life calculating trajectories for Army Ordnance. Computers in the past quarter century, though, have become file-oriented data processors – not primarily scientific calculators. Both Eckert and Mauchly say this was their intention when they went into the computer making business after the war.

Mauchly said his first target was the Census Bureau. The bureau has a long history of pioneering in data processing;

(Continued on Page 4)



And the father of all computers, Eniac, "the 30-ton electronic brain that can 'think' a million times as fast as Einstein" according to a 1946 news story.

Rebundling?

Fixed Price SE Work Offered S/3 Users

By Don Leavitt
Of the CW Staff

WHITE PLAINS, N.Y. – IBM continues easing back towards bundled systems engineering.

The company has announced that it will provide individually tailored, fully operational programs at fixed prices for System/3 Model 6 users.

Under a new, fixed-price, extra cost option, it will provide RPG-II source code for programs designed under the Application Customizer Service (ACS) for 3/10 users.

Last month, IBM reinstituted on-site SE support at no charge to users of Class B software for the 360 [CW, Aug. 25].

The extra cost Model 10 Customized Source Code (CSC) option is available immediately, while the Application Programming Service (APS) for the Model 6 will be ready next month, IBM said.

In both cases, the applications initially available will be in order writing and invoicing, inventory accounting and management, accounts receivable, and sales analysis.

Under APS, IBM's SEs will work with the Model 6 user "to

(Continued on Page 4)

There were 150 products on display at the Canadian Computer Show. (CW Photo by E.D. Lundell)

Canadian Show Reflects Universal DP Problems

By E. Drake Lundell Jr.
Of the CW Staff

TORONTO, Ont. – That the problems and worries of data processing users are as multinational as the industry that supplies them was clearly in evidence here last week at the Canadian Computer Conference and Canadian Computer Show.

The conference, attended by over 1,000, was concerned primarily with the universal problems facing computer users – data center security; communication with top management, the public and government; expanding application areas; timesharing and communications; and more efficient computer utilization.

Noting that Canada "ranks second only to the U.S. among the major countries in the world in the per capita use of computers," keynote speaker William V. Moore, president of IBM Canada Ltd., said future computer use "is going to be just as exciting, as dramatic and as fast paced as in the past."

Users and manufacturers alike have done "very little" to promote the understanding of computers among the public, he noted.

"If anything, we have complicated things. Whether we like it or not we have managed to form a cult over the years. We have developed our own special jargon and have tended to surround the industry with an air of mystery."

A major future challenge to the entire computer community will be to get rid of this mysterious air, he said, adding, "We have got to start communicating with people both inside and outside

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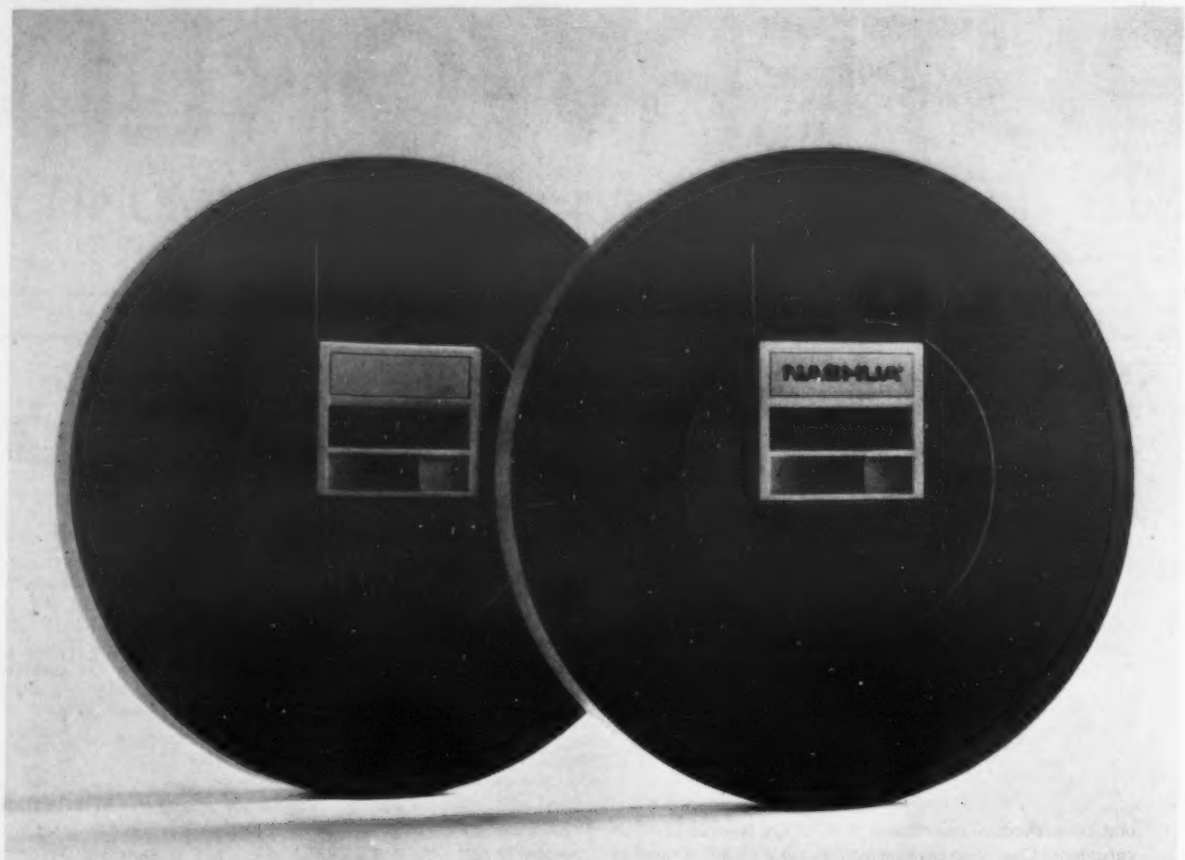

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News Wrapup

Hawaii Compiles Jailbird Data for Penal Profile

HONOLULU, Hawaii – Individual profiles of offenders in this state's correctional system are being compiled for computer analysis in an attempt to determine what type of overall correctional system is needed to care for the penal population. The State Law Enforcement and Juvenile Delinquency Planning Agency (Slepa) is conducting the study. The compilation of about 4,300 offenders will give a projection of the type of offenders the state will have to deal with and what type of facility will be needed to house them, according to Kendrick Wong, Slepa correctional specialist.

DP Being Used to Prepare Survey of National Courts

WASHINGTON, D.C. – A survey on national courts for the Justice Department's Law Enforcement Assistance Administration (LEAA) is being prepared and will be analyzed with the aid of a computer. The National Court Survey will canvass 13,000 court systems in the U.S. and is expected to provide a comprehensive description of the nation's judicial system.

Said to be the first of its type, the survey is a prerequisite to future studies of the courts. LEAA anticipates the information, analyzed by a Univac 1108, will form the foundation for a possible future program of national judicial statistics.

Survey Shows Over 60% British DP Users Turn to Outside Help

LONDON – Over 60% of Britain's computer-using organizations use service bureaus, according to a report prepared by Allied Marketing Services, here. Based on a survey of 600 business and government computer users, the survey shows 10% use external services on a continuous basis, and 50% on an ocasional or seasonal basis. The majority of bureau business involves data preparation, while continuous users require a wider range of services including hiring computer time, programming and complete processing applications, the report notes.

Two thirds of the users engage service bureaus for routine accounting procedures or payroll. Other uses frequently mentioned in the report, are stock control, file set-up, and market research analysis. Between 5% to 10% of users contract out all routine accounting and payroll work; about 30% do so occasionally, according to the report.

One Small Computer to Museum; One Large List of Future Users

BOSTON, Mass. – Add one computer to the growing list of installed machines, but add 150,000 people to the list of users.

That's the prognosis, now that the Children's Museum here has been given a PDP-8 by Digital Equipment Corp. as the first hardware acquisition for its new computer center.

. Richard Gardner, director of the museum's computer project, said other equipment is also being sought for the museum, which hosts 150,000 visitors a year. Gardner said eventual use of time-sharing facilities would enable more visitors to learn the benefits of computerization.

Computer's Output Not Always Just What One Wants to Know

KANSAS CITY, Mo. – All news that comes from a computer is not good. In an exhibit at the Health Careers Fair here, a person giving a terminal linked to a computer his age, race and sex would receive a list of the 14 most likely causes of his eventual death. The booth was set up by the Kansas Regional Medical Program.

$10 Million Savings Seen

Michigan Realigns DP Centers Into 'Functional' Units

By a CW Staff Writer

LANSING, Mich. — The first step in consolidating 10 state DP centers into seven "functional" units was taken recently, when a wall between two autonomous, non-compatible systems was broken down.

A central systems data center will be the result of this building modification, which will eventually combine the data centers of the treasury department and the department of administration.

State officials have predicted more than $10 million in savings will result over the five-year consolidation period.

Hardware compatibility will not be an immediate result, but will be accomplished when either the twin IBM 360/40s or the new Honeywell 6040 is returned to the manufacturer. This move will take place late in this plan, which began in July.

An "old" GE 427 has already been returned, according to Glenn Goodman, director of the Management Sciences Group, a committee of DP experts appointed by Gov. William Milliken to develop a long-range management information system.

The result of their work is the State of Michigan MIS (Sommis) Report, prepared in cooperation with Planning Research Corp. of Los Angeles.

The Sommis Report, according to Milliken, "contains several new concepts for progressive management improvement . . . which I believe will ultimately benefit all our citizens."

Milliken approved the report with such enthusiasm that he sent copies to all other governors.

Detroit the Center

The seven centers will include a "geographic" data center in Detroit, plus the more functional centers for central systems, education, criminal justice, regulatory and licensing, engineering and scientific, plus health and welfare.

The new centers were designed to "ensure compatibility with future changes" in program and organization, the report stated. "At the same time, advantage will be taken of economies of scale from consolidation of facilities," the report promised.

At the end of the five years, the government anticipates DP expenditures will be $21.4 annually, instead of the $26.7 projected recently by various studies. Savings may be realized as early as the current fiscal year, Goodman related.

Included in the plan is a program budget evaluation system designed to provide a "transition to a program-structured budget" for the state, the Sommis report asserted.

Twin Computers Enable Grid to Reroute Power

PHILADELPHIA, Pa. — With a few notable exceptions, summer passed relatively trouble-free for computer users in areas with marginal power reserves.

Despite the fact July and August are normally the most difficult "power months" because of extensive heat waves and consequent high use of air-conditioning, users have experienced crises in September, too.

In fact, it was a year ago today that general purpose digital computers were used by the Pennsylvania-New Jersey-Maryland Interconnection (PJM) to avert such a crisis. Twin IBM 360/50s are used for automatic exchange of electric energy, despite the fact that most other power grids use specially designed computers.

On Sept. 22, 1970, users throughout the nation were wondering about the adequacy of electric power, and the East Coast was gripped in one of the worst heat waves of the year.

But computer operators at PJM were keeping cool using CRTs and light pens to help route electric power over various transmission lines to meet potential emergency situations.

One Model 50 is used for back-up and administrative chores, while the other is on-line, monitoring frequency, generation, and transmission-line power flows. It also simulates the effects of power breakdowns, and CRTs assist dispatchers in finding the most effective and efficient alternate routes for bringing power into an area.

Last September the system was credited with preventing the "cascading" of power failures and overloads. When dispatchers needed an evaluation of potential transmission lines to be used in rationing out the power, the computer would provide video displays of the choices.

'Red Lines'

When power lines were nearly overloaded, they showed up red on the CRT and dispatchers chose another route.

The "safe" lines were displayed in white, and these were used to transmit the power, after generators serving the "white lines" were speeded up and those serving the "red lines" were slowed down or curtailed.

H. Gordon Stewart, supervising engineer at PJM, said the failure could not have been averted so effectively, had it not been for the computer. He said the computer enabled PJM to optimize use of the power grid system, adding, "That's what it does for us every day, whether we face a crisis or not."

The system has been in operation for about three years, and Stewart said the computer would eventually be programmed to "know" the cheapest source of power at any time, making cheaper power available to consumers.

A 'Quake That Doesn't Shake?

LOS ANGELES — An "earthquake" will hit Century City, but no one will feel it. A computer simulated earthquake will occur as part of studies on the resistance of the city's multi-story buildings to earth tremors. Gary C. Hart is conducting the one-year experiment at UCLA.

WHY USE ROSCOE WHEN CRJE AND TSO ARE FREE? SIMPLE. TO SAVE MONEY.

CRJE

Over a period of three months, ADR conducted an objective and comprehensive comparison of ROSCOE (Remote OS Conversational Operating Environment) and IBM's CRJE (Conversational Remote Job Entry).

During this time both systems were operated for many hours and evaluated using criteria generally accepted by the industry as standard for measuring and judging the merits of software.

The basic purpose of the comparison was to examine the similarities and differences between the two systems, and to determine the advantages either might have for you, the user. Here are the results of this study.

Functions, Facilities, Ease of Use.

ROSCOE and CRJE have approximately 19 facilities common to each other. CRJE has 7 features for which ROSCOE has no counterpart, while ROSCOE has 20 features for which CRJE has no counterpart. CRJE's seven features represent, for the most part, conveniences to the programmer. Many of ROSCOE's 20 unique features are major capabilities (Dartmouth BASIC, COBOL syntax checker, post-processor) designed to increase programmer productivity, reduce overhead, and make the system more attractive to non-programmers.

Both systems have a diversified selection of terminal commands and options. CRJE's command format and syntax is similar to the Job Control Language (JCL). ROSCOE'S command repertoire is oriented toward the COBOL and FORTRAN applications programmer who may not be overly familiar with JCL.

From a user's point of view, a CRJE terminal is at any given time in one of several modes of operation, each of which accepts certain commands or subcommands. There are no modes of operation associated with a ROSCOE terminal and thus no distinction is made between commands and sub-commands. ROSCOE permits explicit, implicit, or editing commands to be entered at a terminal interchangeably.

Core Memory Requirements.

A ROSCOE System without syntax checkers supporting 5 terminals requires approximately 50,000 bytes. A comparable version of CRJE requires 80,000 bytes. A ten-terminal version of ROSCOE with syntax checkers averages 80,000 bytes. A comparable CRJE system requires approximately 130,000 bytes. Depending on configurations, ROSCOE generally requires 30% to 45% less core than CRJE.

Direct Access Storage Requirements.

ROSCOE's active files can reside on any direct access device—disk, drum, or data cell. CRJE's active file resides on 2311 or 2314 disk.

Disk space for ROSCOE's libraries are allocated using a factor of 4000 records per 2314 cylinder. CRJE's libraries are allocated using a value of 1400 records per cylinder.

A ROSCOE System with storage capacity for 400,000 source statements requires ½ of a 2314 disk pack. A comparable version of CRJE requires 1½ 2314 disk packs. On the average ROSCOE will use 60%-70% less disk space than CRJE.

Operating Speeds.

In general CRJE is faster for single line operations, while ROSCOE is faster for multiple-line or file-type operations. On a dedicated system, with one active terminal, changing a single line of data in CRJE takes one second, while changing a single line with ROSCOE takes 5 seconds. Changing multiple lines of a file with ROSCOE takes 20 seconds, while a similar operation with CRJE takes 80 seconds. With several terminals active simultaneously, changing a single line averaged 14 seconds for ROSCOE and 1 second for CRJE, while changing multiple lines averaged 53 seconds for ROSCOE and 420 seconds for CRJE.

The total elapsed time required to perform eleven fairly common data manipulation functions were—at the ROSCOE terminal, 112 seconds; at the CRJE terminal, 361 seconds. For all tests performed, total elapsed times for ROSCOE were superior by ratios ranging from 3:1 to almost 5:1.

Overhead, Reliability, Support.

ROSCOE degrades background batch processing by approximately 10%, while CRJE's degradation factor is 20%. ROSCOE, as a result of 2 years of production use, is 100% reliable. No reliability figures are as yet available for CRJE.

Both ROSCOE and CRJE are fully supported by their respective manufacturers. ROSCOE is periodically enhanced and redistributed to users.

Initial and Continuing Costs.

ROSCOE's initial cost is $12,000 while CRJE is an unpriced system control program. Using proportionate shares of the monthly rental for hardware dedicated to the two systems, dollar values for operating costs were calculated. ROSCOE's monthly operating cost at a typical installation is $3,300 per month; CRJE's operating cost is $6,500 per month for a comparable installation. The difference in total costs (both initial and continuing) associated with the two systems at a typical installation over a three-year period is shown in the table below:

	AFTER 12 MONTHS	AFTER 24 MONTHS	AFTER 36 MONTHS
CRJE	$78,888	$157,776	$236,664
ROSCOE	52,416	92,832	133,248
COST DIFFERENCE	**$26,472**	**$64,944**	**$103,416**

Although these dollar figures will vary significantly from one installation to another, the percentage of difference will tend to remain constant, and the total costs associated with ROSCOE will be consistently and substantially less than those for CRJE.

TSO . . .

TSO, which has functional similarities to ROSCOE, is due for release on June 30, three months behind schedule. According to IBM, additional field testing is required, while according to a TSO user the problem of "unspectacularly slow performance" necessitates coding changes. (*Datamation*, April 15). Although a thorough evaluation of TSO is not possible at this time, an examination of preliminary literature indicates that operating costs will be 5-10 times greater than for ROSCOE.

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'Computer's Limits, Man's Limits'

(Continued from Page 1)

for example, Herman Hollerith built the first punched card tabulating system to handle the 1890 Census.

Since that time the bureau has always been open to new ways of coping with its expanding information handling problems. In addition, it had the money to spend on new data processing equipment.

After the war, the next step in developing EDP was "research and development on better ways of input/output," according to Mauchly. The Census Bureau "was a place that had a whole combination of data processing needs, part of which were scientific . . . On the other side they had a massive I/O problem reducing the population census to a rather massive output of tables."

Another choice for the original selling of computers was insurance companies. "They had very high quality mathematicians working for them as actuaries," Eckert said, "and they had both actuarial problems in statistics and just hellish files to keep track of. They immediately brought the two together."

Financing the Eckert-Mauchly Computer Corp. wasn't easy, Mauchly recalled.

Early Financing Problems

"Businessmen were not inclined to look at developments using vacuum tubes as being very pertinent to anything they had been thinking about," the physicist said.

"We were told by people in Wall Street that it sounded pretty zany . . . we couldn't get anybody in the financial community to back us in this thing.

"We backed ourselves as long as we could and then got other industry people to help us as we went along, eventually selling out to Rem[ington] Rand."

In the early days at Univac, Eckert revealed, there were disputes over whether to make two different computers for business and scientific applications, or to make one machine capable of both.

Too Many Bells Prove Nothing

"Then IBM came out with the 360, which doesn't separate them at all," Eckert said. "In my opinion IBM went the other way; they put 150 instructions even in their smallest machines where half of them are useless. In other words, they put floating point in a 360/30, which is ridiculous.

"I used to kid Fred Brooks [one of the three architects of the 360s] about this. He had all sorts of rationalizations about why he did it, but it never made sense."

Political Impact?

The future impact of computers "will, I hope, eventually be political," Eckert said.

"I feel that a great deal of our democratic system is based on methods of communication that existed 200 years ago . . . . I think there should be some kind of real-time voting on issues in this country.

"For example, the President just clamped the lid on prices and wages. I think the public should vote whether they want it or not. I think they'd vote for it, but I'm saying they should vote on issues like that.

"You can actually go to the polls some 25 times a year in Switzerland," he continued, "and since it's a compact country it's no hardship. We could do it over the telephone."

The executive branch of the Federal Government has some 4,600 computers, Eckert noted, while the legislative branch has three – one at the Library of Congress and one each in the House and Senate for bookkeeping.

"And they're supposed to analyze this massive pile of junk that comes in from the Executive Department."

He suggested the use of remote terminals to help legislators keep track of bills, and congressional computers to sort the deluge of information.

According to Mauchly, "There's almost no place [computers] haven't had some effect all the way from payrolls to the ability to get things done that were impossible before, like going to the moon.

"You may say, 'Why go to the moon?' but nevertheless, if you are going, you've got to have a computer to do it. There are very few of us who are Jules Vernes; my imagination wasn't good enough in 1946 to see anybody going to the moon.

"Nobody at that time was really hep about shooting missiles out into space, to say nothing of putting men in them. We totally missed that as a possible application . . .

"[But] I don't think I ever saw or Eckert ever saw any particular limit. The limitations of the use of the computer are the limitations of the human mind and imagination. The limitations aren't in the computer, they're in us."

Mauchly and Eckert were honored guests at ACM's celebration of Eniac's 25th birthday. Both are still active in EDP, Eckert as a Univac vice-president, and Mauchly as president of Dynatrend.

DP Problems as International as Industry

(Continued from Page 1)

our companies."

Educating the public about computers is as important as or more important than educating management in the business world, Moore said.

Need Informed Public

"The data processing industry in all its various forms is far too critical an influence on the social and economic future of our country to be understood only by the experts," he said, adding, "We need an informed public."

In that connection, Angus J. MacLeod told a conference session that the public is "beginning to wonder whether or not increasing technology improves the quality of life.

"We are extremely fortunate that, to this point in time, no concerted drive to 'control' the effects of computer systems technology from outside the industry has taken place," said MacLeod, vice-president of DCF Systems Ltd.

But "if we are to avert these external pressures and controls, or at least reduce the traumatic effect they have had on other areas of science and technology, we must be sure we have attempted to anticipate the broader effects of our technology."

To reduce the possibility of serious problems arising with computer systems that could cause a call for controls, MacLeod suggested that better methods need to be developed in building new systems.

These new system development plans should consider the requirements of the ultimate users above the strict technological requirements of a systems, he indicated.

At the same time the exhibit, which drew products from over 150 companies, emphasized devices that also find receptive audiences in the U.S.: add-on and replacement core memories; terminals, especially displays; communications equipment such as multiplexers and modems; minicomputers and independently manufactured tape and disk equipment.

There was little new on the exhibit floor as the exhibition consisted primarily of U.S. companies, their Canadian subsidiaries, or representatives selling products of American firms.

Canadian firms dominated the data center and time-sharing fields, with four or five firms displaying their wares.

The strong showing in this area clearly represented growing strength in Canada, even though reports have circulated that this field is overpopulated "north of the border."

This subject was also touched on by Moore in the keynote, when he called for Canadian firms to begin competing in the U.S. market.

"Why shouldn't the Canadian data servicers be thinking of establishing subsidiary operations in the U.S.? I am confident they can write programs that can be used on a world-wide basis," he said.

"There's a vast market in Canada and the U.S. and it represents a real opportunity for our Canadian data servicers who have come through a difficult period."

The overall conference was opened by Robert Welch, Ontario's minister of education, who noted that the "worlds of education and computing are merging quickly."

Douglas Dyment of Datagen of Canada Ltd. demonstrates Nova.

At the same time, "There is one part of the educational process that still needs some special attention, and that is support for the instructional programs," he said.

"We still need," he continued, "a very fast, very inexpensive way of processing student programs – fast enough to meet the demands of enthusiastic teenagers, inexpensive enough to meet the demands of taxpayers."

The issues, companies and participants at the gathering were very familiar, but the setting was different and, while smaller than last year, the Canadian Computer Show and Conference appears to be becoming a set fixture of the Canadian landscape – and the exhibitor list of shows.

S/3-10 Users Get Source Option

(Continued from Page 1)

determine details of the jobs to be programmed," the announcement said. After coding, the programs are to be tested "by the systems engineer" on the user's machine or on one at an IBM Business Systems Center.

Testing and debugging will continue, IBM said, until the programs are ready to run according to the user's needs. Cost of any tests conducted at the IBM center is included in the fixed price of the application being developed.

Programs developed under APS are written in RPG II and will be packaged with enough documentation so the user can perform maintenance, IBM said. The charge for any one application is $1,350; for two, $2,600; for three, $3,650; for four, $4,600, a spokesman said.

Programs produced under the CSC option are not as completely tailored as those produced under APS. Nor are they debugged before they are presented to the Model 10 user.

They are what might be described as "raw," computer-generated RPG-II source code based on the user's original ACS questionnaire.

Without the option, ACS produces logic charts and other programming aids, but the user must code the RPG-II spec sheets himself. With CSC, IBM said, the user "need only add his own specific application data, and complete any modifications" to the generated code before running the programs.

"Specific application data" the user may have to add before the programs become operational would include any constants or other elements that cannot be entered through the ACS questionnaire, the IBM spokesman explained.

The CSC option carries a $100 charge per application, in addition to the charge for the basic ACS support which varies by application from $185 to $265.

The user is also charged for CPU time at current rates at the IBM center that is providing the service.

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Coal and Computers Prove Smart Combination in U.K.

By Edgar Wille
Special to Computerworld

CANNOCK, England – Computer Power is one of the largest computer services in Europe. It is a subsidiary of the National Coal Board (NCB) – the British State Coal Industry whose computer experience goes back 15 years.

NCB is a large business by any standards, with an annual turnover in excess of $2 billion and employing 350,000 people.

Computer Power employs about 1,200 people and, in addition to covering all NCB's computer needs, maximizes its resources by offering a full bureau service to industry and commerce in general.

The training school is a key element in Computer Power's success. It is located at Cannock, Staffordshire near the junction of three main British highways.

Each year the number of 'students' totals about 2,500, attending courses ranging from two days to four weeks.

In addition to full time instructors, the school can and does utilize the expertise of some of the 200 computer professionals employed by Computer Power.

Computer Power full time trainees, whether university or high school graduates, are involved in an 18 month training program. After company induction and introductory computer courses they are given two months in Computer Operations Departments at one of the seven computer centers, using 10 large IBM or ICL computers. The program then proceeds with a basic Cobol Course, programming experience, a Cobol development course (covering efficiency standards and the exploitation of machine software), further programming experience, an advanced programming course (covering machine language and additional efficiency techniques).

By this time the trainee should be a competent programmer and can move into the more specialized fields of software or systems design. This development is catered for by futher courses, including a four week systems design course. All these courses are open to non NCB members (from either side of the Atlantic).

In-House Coordination

An important factor in the success of Computer Power lies in user courses, designed to ensure that users maintain a proprietorial interest in their systems.

Within the NCB, when a project is approved, a purpose and objectives course is organized for upper and middle departmental management to get the design process airborne.

Prior to the system going 'live,' a series of implementation courses take place to explain the operational procedures to departmental management and staff. The pattern of these courses is completed by use and review courses, which formalize discussions on the development and exploitation of the system.

NCB is installing a large number of on-line terminals and, wherever these terminals are installed a number of user department staff are trained to write their own programs. Interrogation of the data base is also being taught increasingly as its effectiveness develops. These courses permeate the whole organization with computer awareness.

Computer Power Training School also runs specialist courses in conjunction with U.K. professional bodies like the Institute of Personnel Management, Institute of Purchasing and Supply and Association of Certified Accountants.

The fundamental approach is to regard computers as business tools, and as such a means to an end. The success of Computer Power training certainly suggests this approach is coming to be appreciated by British business. Computer Power has made it a key doctrine of its policy to take training seriously and not allow it to be treated as a Cinderella of the business It is certainly paying dividends.

E. Wille is Head of Training at Computer Power.

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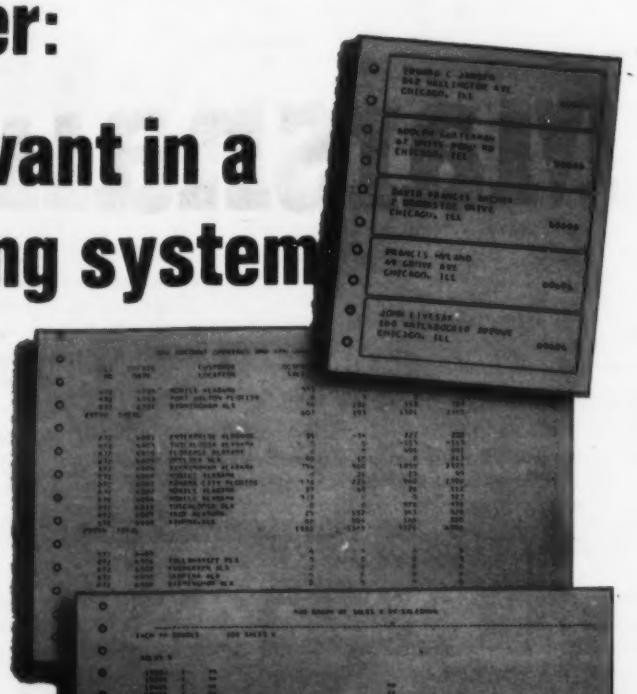

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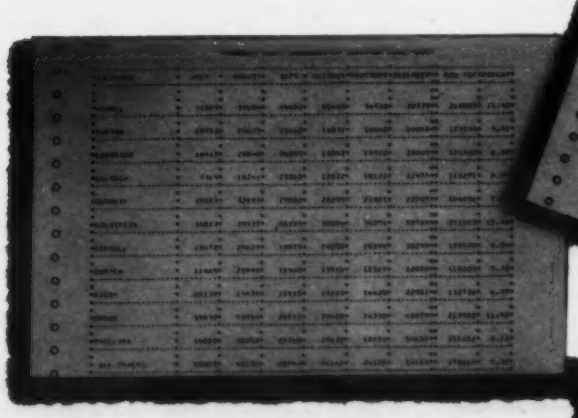

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United Airlines Opens $6.3 Million DP Center

By a CW Staff Writer

DENVER – Apollo can now mean something for people bound for places on this earth, too, now that United Airlines has opened its $6.3 million passenger services computer center here.

The space-travel-like name is the one United chose for a nationwide network that can pour up to 30,000 messages per hour into the airline's passenger information pool in the two-story computer building on the airline's recently completed six and a half acre site at the Denver Technological Center.

United says their Apollo system – when fully operational in July of 1972 – will be the largest and most advanced passenger information system in the air travel industry.

Presently using three IBM 360/65s, Apollo handles the seat inventory program, passenger name record program, and programs to account for hotel availability information and tour information.

The seat inventory program controls the daily seat inventory on more than 1,500 flight departures and gives seat availabilities on both United flights and the flights of 30 other airlines for 340 days into the future. Plans call for the seat programs to include seat selection, check-in information, and automatic ticketing programs.

At present, Apollo is directly connected to auto rental and computer airline offices as part of the passenger services system.

Apollo's configuration, besides the three 360/65's, includes 14 IBM 2314 disk units on-line, each one with eight spindles.

Field I/O is accomplished on Incoterm SPD 10/20's, a keyboard CRT "smart" terminal with a 4K memory. Presently, 1,000 SPD 10/20's are included in the Apollo system, but United says it has plans to increase them to 2,800.

The future plans also call for the replacement of the 65's with IBM 360/195s, and the installation of 3330 disks to replace the 2314's.

Almost totally-automated, the United System's staff consists of only 170 people at the Denver Center. A United-owned power plant furnishes the electricity for the computers and environment control.

Three turbines support the United Apollo system, with a fourth in back-up so that power to the computer center remains constant.

United's plans call for Apollo to connect with all 97 United airports and 80 city ticket offices when the system becomes fully operational in July of next year.

More Time for Analysis

DP Does 'Bookkeeping' As Researchers Study Drugs

CHARLOTTESVILLE, Va. – "Sometimes I think many researchers spend all of their money and time in the information gathering process, so that little money or time is available for the analysis which, to me, seems more important," said a drug researcher.

Medical and pharmaceutical problems need computer technology; "its value is only now being discovered," said Dr. William A. O'Brien, who noted information retrieval and storage by computers is a necessity for more efficient use of laboratory technicians' time.

Computer use allows technicians to devote almost all of their efforts to laboratory determinations, and relieves them of repetitive entries and arithmetic calculations, he explained.

"Methods of getting information now, today, and using that information intelligently" provide the key to successful medical research, he said.

Data collection and usage "can be done more easily," he added, "by a computerized data communications system than by any other method. The day of computer data communications in the medical field is fast approaching," he said.

Dr. O'Brien watches as terminal prints out complex medical forms to be distributed to other doctors in drug evaluation study.

That day is already here for O'Brien, who time-shares on a Bethesda, Md. computer to compile profiles on drugs used in the treatment of rheumatoid arthritis.

Using a General Electric TermiNet 300 teleprinter on campus here, O'Brien obtains printouts of complex, tailored medical forms for use by a patient control group in drug trial investigations.

The teleprinter is a valuable tool in this kind of program, "both repetitive and complex," he noted, since it saves time and allows flexibility.

Quick, Accurate

To insure quick and accurate compilation of data from trials, O'Brien decided what was needed was an information storage and retrieval system that could operate repetitively, quickly, and accurately.

In addition to producing the medical history forms, the printer provides bibliography sheets allowing comparisons between a new drug and an existing, proven one.

The program stored in the Maryland computer enables O'Brien to prepare in a matter of hours the history forms that would have taken weeks to prepare manually.

The forms are arranged as numbered and paged manuscripts, and are mailed to participating doctors at each of 16 university-associated clinics.

"These forms are one of the most important aspects of the monitoring system," O'Brien said. "They are the documents we will use at the trial's end to make our final analysis, and can be readily filed for future reference."

Cycling and Recycling

Providing the variety of forms for each drug trial week (the tests can run anywhere from two months to two years) is done through cycling and recycling the program, to instruct the printer what copies are to be made, and the doctors what tests are to be conducted.

This redundancy, plus the ability of the system to prepare tailor-made form copies for individual patients with side effects possibly caused by the drug under investigation, make the system a valuable information gathering tool, he noted.

"We think that our method of supplying both instructions and the properly coded forms to doctors is a tremendous time-savings not only for them, but for ourselves as well," he added.

The author of the program, O'Brien said it relieved doctors and researchers of the tedious chore of routine bookkeeping, giving the medical professionals the time necessary to "think seriously" about "unusual problems experienced by individual patients" during the drug trials.

The 16 medical clinics involved in this research program are located in major cities from Los Angeles to Boston, and the number of patients has varied from 64 to 533 in any one evaluation.

Indiana, North Carolina Police Nets Join FBI's Crime Information Center

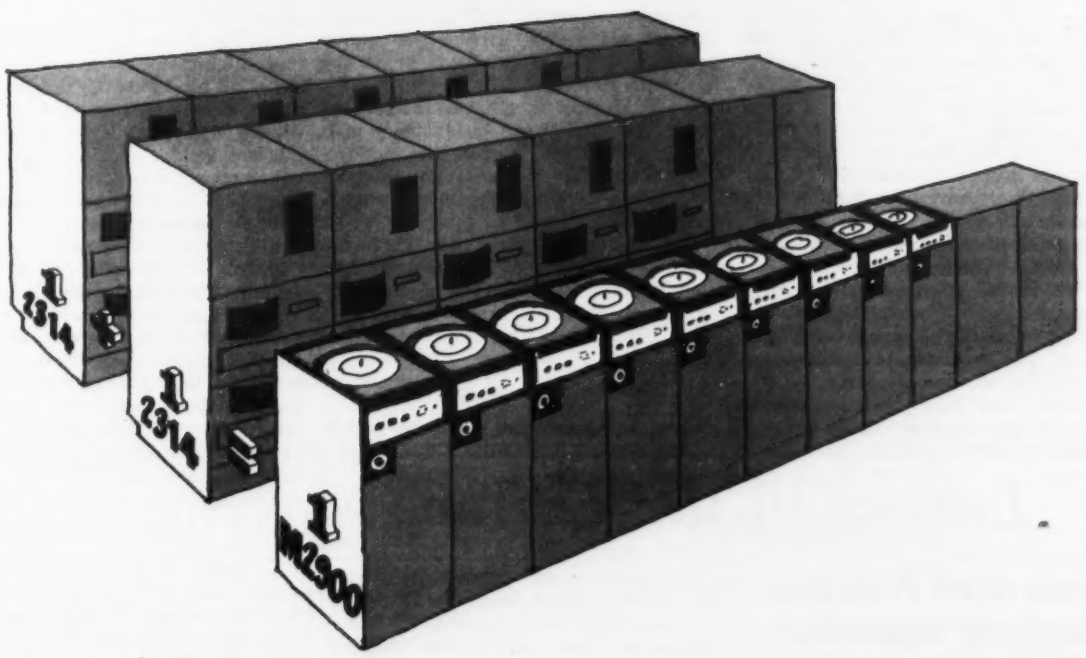
WASHINGTON, D.C. – Police information networks in two states are reported near the final implementation stages, and tie-ins to the FBI's National Crime Information Center (NCIC) have already been made.

The Indiana Data and Communications System (Idacs) started operation June 1, and performs the usual administrative tasks as well as the police applications for the state. The $6.6 million Idacs complex is located in the state office building in Indianapolis, and two cities are already operating on the police side of the system.

All of the Indiana State Police posts are also tied into the system, and eventually all of the state's 92 counties and every major city will be connected, according to local sources.

In North Carolina, the Police Information Network (PIN) is "semi operational," according to Sgt. W.D. Parks. Some of the cities and state agencies have not as yet received their terminals, Parks said.

Marshall M2900 Saves 45%



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Cost:	$5,545 per month	$10,128 per month
Storage Capacity:	466.8 Million Bytes	466.8 Million Bytes
Space Requirements:	150 Square Feet	360 Square Feet
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Start/Stop Time:	24 Seconds	82 Seconds

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Editorial

Stand and Be Counted

The Compata report [CW, Sept. 8] pulls together and spells out what everyone knows, that the System/360, like most computer systems, can be made much more efficient.

Although the report was prepared for the Computer Lessors Association, it is not surprising that the CLA has not rushed out to implement the recommendations. The CLA is not in a position to act rapidly in this area because the association is composed of businessmen, not users.

But we were disappointed that the users groups didn't react. Users groups are in the best position to finance and coordinate an improvement program.

If you can increase the throughput of a 360 by 100%, you are effectively cutting its price by 50%, thus putting it within reach of organizations that now can't afford one. If the users groups followed through, they would not only benefit their members but do a service for mankind.

The price of data processing must come down a lot more before it can be used everywhere it's needed.

'Sorry, No More Room'

DP Seen Having High Potential for Improving Life

The following is excerpted from remarks made by Dr. Edward E. David at a meeting sponsored by the Computer Science and Engineering Board of the National Academy of Sciences. David is science adviser to the President.

I look upon the computer as a resource for the nation, and indeed there are many national problems to which it seems central.

One of these is the area of productivity. The rate of productivity increase in our economy in the past few years has been slowly declining. This means that the output per worker is not increasing as rapidly as it did in the past. The figures are something like this. The average yearly productivity increase from 1948 through 1968 was about 3.2%. Since that time it has dropped to between 1% and 2% although recently we have seen a higher rate.

Some economists have said this productivity lag is a cause of inflation since wages have been going up more rapidly than productivity. When one looks into the structure of the economy, the importance of the computer in the productivity context becomes evident.

Currently, the sum of these people working in agriculture and manufacturing is about 45% of the total U.S. work force. On the other hand, 55% are engaged in rendering services of one kind or another including, for example, education, health care, and government operations. This means more than half of our workers are engaged in the service industries as opposed to those which produce real goods.

If we look into the future, we find an even more startling situation. In 1980 it is estimated that 65% will be in the service industries. Taken with the growth of jobs, this implies a rather startling fact; namely, nine out of every 10 new jobs created between now and 1980 will be in the service industries.

From this brief sketch, you can see that if we are to improve productivity markedly, a substantial part of that improvement must come in the service industries as opposed to improvements in manufacturing productivity.

I might add that since only 5% of the work force is engaged in agriculture, and that figure is still shrinking, productivity improvements in agriculture will have little overall effect on productivity figures.

'Not That Simple'

Now, computers and computer-related technologies have a high potential for improving service sector productivity, but, as you well know, it is not all that simple. In addition to the factor I mentioned earlier, namely the necessity for allowing users to participate in the process of computer-induced change, there are several other necessities.

Viewpoint

You can name many of them, but one that is clear-cut concerns economies of scale. All too often the prospective economies leading to improved productivity depend upon high levels of traffic. This involves system considerations including communication techniques to cover geographically distributed populations and multiprogramming as an aid to sharing facilities among many users.

Finding a critical mass of users to generate the necessary traffic is only one of the many impediments to applying computers in the service sector. You know of many others, such as the cost of terminals. This is a major hurdle, but the point is that we clearly need focused efforts to solve such problems. Needless to say, their solutions would be good for the computer industry but also, of course, good for the nation.

Foreign Trade

A similar situation exists in foreign trade. Here again our index of performance as a nation is disquieting. We have seen our foreign trade balance dwindle to about $1 billion out of about $40 billion of total exports.

We do best in high technology products, and we run a large deficit in labor-intensive products. This story is undoubtedly well-known, but again a close examination of the anatomy of the problem indicates that many of our manufacturing industries cannot compete because of the differential in wage rates and antiquated plant.

Here again computers can provide a way of overcoming the differential, but there are the difficulties of gaining the necessary rapport with traditional industries. The labor unions as well look with some suspicion on computers. Solving this set of problems in a humanitarian and effective way is a real challenge to the computer community.

So far I have been talking about using computers to improve the performance of our economy and our economic situation in the world.

The nation requires also that computers be used to improve the quality of life. Here one can think of many possible applications, but the one that appeals to me the most lies in the areas of privacy and individuality.

Now, it is often said that computers are a challenge to the privacy of the individual and to individuality itself. Indeed, it cannot be denied that computers have been used in just these ways in the past. However, these effects are not intrinsic to the computer itself.

To Protect Privacy

Computers can be used to protect people's privacy. I dare say that a well-designed computer system can be made more nearly private than the manual filing methods used today. The technology and technique to accomplish this is in hand or nearly so.

Some further innovative effort can provide further advances, but the problem is that systems designers and their customers have not seen fit to utilize the available technology to protect people's privacy.

Again, in this area the question of efficiency and costs arises. It may well be true that special hardware will have to be incorporated into computing systems to facilitiate the elaborate protective mechanisms which in the end will be required for adequate privacy.

The impetus for these developments has been slow in coming, but I believe we will see incentives by government for such developments. Sen. Ervin has held hearings at which issues concerning privacy and computers have been examined.

The executive branch of the government too is looking at these problems, and it may be that the day will come when we will see privacy standards established and published. This should not be necessary, but many people believe that it is. It is not too much to say that the government will not shirk its duty in this regard.

As for individuality, again computers can be the key to the individually tailored service or product. This has been one of Dick Hamming's long-time themes and I certainly agree with him. Yet, we do not see a widespread attempt to use computers in this fashion. Again, I think that the future health of the computer industry depends upon successful attempts in this direction.

I feel strongly about all of these matters because of the clear signals we as scientists and engineers are getting from the public about the malevolent effects of technology.

Letters to the Editor

Supreme Court Predictions 'Scientifically Defensible'

In reply to Daniel Frawley's letter [CW, Aug. 26] I will gladly match my record of predicting the outcome of Supreme Court decisions and the votes of the individual justices against anyone.

But beyond the comparison of predictive accuracy lies a more basic issue – the distinction between forecasting and prediction. This issue is of direct concern to the philosophy of science, a subject with which Frawley appears unacquainted.

Unlike forecasting, prediction in social science follows from the development of an intersubjectively transmissible theory of behavior. This, of course, is the essence of scientific explanation.

For many reasons – complexity of subject matter, ethical preclusion of experimentation, lack of theoretical and methodological rigor, insufficient funding, etc. – social scientists to date have functioned imperfectly as scientisis. Hopefully, this situation is changing.

As for my work, my predictions are deduced from a theory of judicial behavior and a model of Supreme Court decision-making that are intersubjectively transmissible, and therefore scientifically defensible. I doubt that law clerks can make the same claim – Frawley's pious convictions notwithstanding.

In describing my work as a "ridiculous application of computer technology," Frawley clearly ranks intuitive knowledge above scientific explanation. I can understand such a preference ordering among medieval theologians and Luddites, but from a member of a legislative audit bureau! Tch, tch.

Harold J. Spaeth, Professor
Dept. of Political Science
Michigan State University
E. Lansing, Mich.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Credit Ratings Show Bills Can Be Timely

Recently some of the comments in this column have involved the long period of delay between the time the bills are said to be prepared, and the time that they are actually prepared and sent out. Now I find that there has been an on-going study on this exact point operating for eight years!

The study is produced by a newsletter, *Retailing Today*, in Lafayette, Calif., and includes information received directly from the stores themselves, and from reporters.

It measures the performance principally of New York and California firms, like Bloomingdales, and Macy's, and reports on the number of working days after the cycle closing date up to and including the postmark date on the bill.

The report was started when the California Unruh act went into effect in 1963, and was designed to head off unrealistic laws that were being proposed by various annoyed consumer groups. The rating was designed to bring the appropriate facts to the attention of influential people within store management.

Stores that are able to complete their billing cycles within one working week (five days) are put onto a special honor roll; many stores have reported with pride that they have been placed on the honor roll.

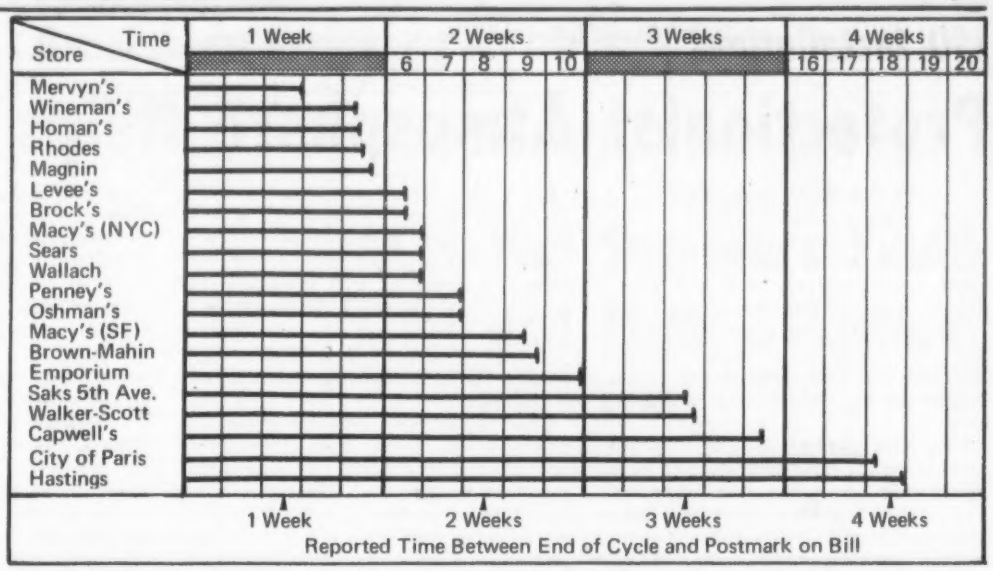

Chart shows the variation of times between the close of the billing cycle, and the mailing of the bills, as reported in *Retailing Today* for the months of February-March 1971. It can be seen that some stores are taking most of a month before the bills are mailed, while in other cases the time involved is cut down to three days.

The Taylor Report
By Alan Taylor, CDP

Recently one store, A. Sulka in New York City, made the Honor Roll only 14 months after it had been reported as taking more than seven working weeks before being able to get out its bills!

The fastest store being reported on is Mervyn's. Here the bills are mailed three days after the cycle closed – a day in front of Ohrbachs and Wineman's, each of which managed a four-day turnaround.

Mervyn's has seven stores doing a combined volume of approximately $50 million, and the billing department has to handle around 75,000 accounts a month. It has a computer, but an unusually small one, the NCR 200.

The account number is collected at the time of sale, generally using credit cards, and punched paper tape produced at that time for computer intput. Descriptive billing is used, and the bills start going in the mail on the second day after closing, and are completed by the third day.

This is an interesting way of going about it, and one which shows the value of planning instead of simply just ordering the biggest computer around.

Robert Kahn, who puts out *Retailing Today*, tells me he has not heard of the idea of letting customers pick their own billing date, as was suggested here earlier, but he is going to check around and ask some of his retail friends about the idea. He thinks that it was just never thought of, rather than having been rejected.

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To Help Arctic Pipeline

MONTREAL, Que. – A computer is being used to find the optimum method of transporting construction materials to the site of the proposed 1,550 mile Gas Arctic pipeline.

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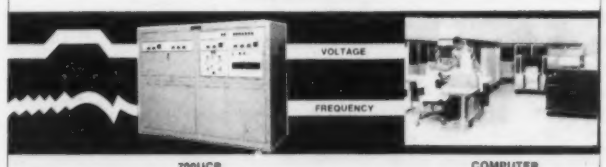

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Protectionist Atmosphere Helps But Also Hurts India

By Bohdan O. Szuprowicz
Special to Computerworld

NEW DELHI, India – In this country of 600 million people and high unemployment a product that does not bear a "Made in India" label is extremely difficult to import. This government policy and the restriction of foreign currency expenditures have limited to a large degree the growth of computer application.

This same policy, however, has been responsible for early emergence of Indian computer manufacturing capability. Today there are three companies manufacturing computers in India for the local market: Electronics Corporation of India (Ecil) Ltd., International Computers Indian Manufacture Ltd. (ICL) and IBM India.

The present data processing community consists of over 150 computer installations which range all the way from a CDC 3600 at the Tata Institute for Fundamental Research to a large number of IBM 1401 systems "manufactured" at the Bombay IBM plant.

There are also 30 ICL machines of varying sizes and at least 10 Honeywell systems as well as two Minsk II Russian computers that came along with the equipment of an Institute of Technology furnished by the Russians.

Only three IBM 360 systems are known to exist in the country. More than 75% of all computer installations cater to more than one user and utilization of computers in India is claimed to be one of the highest in the world.

The average is over two shifts per installation with numerous installations running three shifts, seven days a week. While this utilization indicates increasing demand for computer power, restrictions on foreign exchange and lack of electric components prevents Indian manufacturing from satisfying the demand.

Recurrent fear that automation will lead to additional unemployment in a country where only 30% of the people are ever employed is another factor weighing heavily on the minds of local politicians.

It is argued that in having an abundance of human resources, India could benefit by concentrating on manual methods in routine clerical jobs even at a cost in efficiency. It is feared by some that introduction of computers will not only adversely affect employment but threaten existing status quo.

Promoting Use

Promoting the use of computers and demanding greater government sponsorship in their introduction is the Computer Society of India, a professional body grouping 80 institutions and several hundred individuals.

As early as 1965 the society presented "An Ideal Computer Map for India," arguing for the establishment of several large regional computer centers using the latest systems to obtain maximum performance.

Officials of the society deplore the IBM 1401 "manufacture" in Bombay which they call "dumping of second hand computers in India."

Actually the Bombay plant turns out computers that are originally imported from abroad in parts and have been discarded by previous IBM customers presumably for later 360 models. According to IBM, these 1401s are "modernized" in Bombay with parts manufactured in India.

That same plant also manufactures 029 keypunch equipment and collators, calculating machines and reproducers. Unit record equipment is shipped to over 40 countries around the world including Australia, Canada and Germany, contributing as much as $2 million annually to India's balance of payments.

ICL took a different approach to manufacturing in India and now claims to be the first Indian manufacturer of third generation computers. In 1968, ICL concluded an agreement with India to manufacture ICL 1900 series. While ICL markets and services the machines, manufacturing is performed by Bharat Electronics Co. of Bangalore, a state owned organization.

This appearance of third generation machines was looked upon favorably by the Computer Society of India which commented that the event took place only five years after the introduction of third generation machines in other countries of the world. This according to them was an improvement over a previous 10 year time lag before the first computers appeared in India at all.

While IBM and its activities in India are being praised for some of the advantages it offers its users such as proven equipment and field support, critical voices are being raised attacking some "computer myths." Questioned are the carefully nurtured ideas of sometimes uninformed users as well as salesmen about such IBM goodies as "software libraries" or "world-wide experience" which may apply to owners of large, flexible systems but rarely, if ever, to those sold in India.

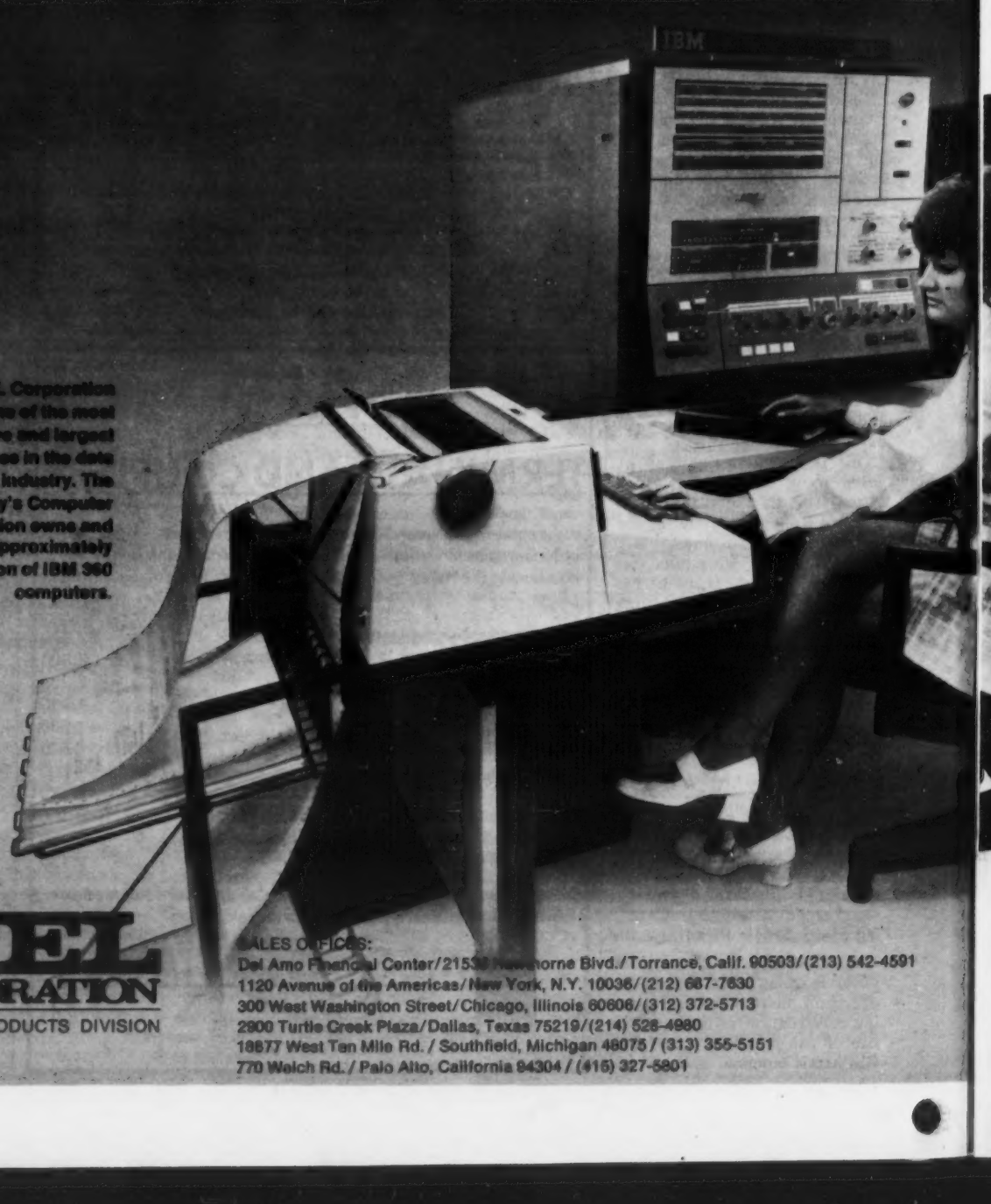
The Economic Times came out publicly last January in a review of the computer scene in the country saying: "... companies and government departments who are getting their money's worth from IBM equipment will certify that it is through their own know-how and software, not IBM's India's ..."

There is of course a software gap to be reckoned with. Present courses on computers and programming are all oversubscribed and the Computer Society of India has taken action to curb wild promotion of programming courses using the promise of good jobs on graduation. There just are not enough jobs for all the skilled people.

A communications gap prevents the introduction of time-sharing in India. There are suggestions, however, that the Indian Trunk Telephone System emulate Bell, or the British Post Office provide service suitable for data transmission.

Considering the second generation equipment in use, there is also strong criticism of pushing for third generation computers while little is known of peripheral equipment which could make existing second generation systems more efficient.

MONOLITHIC MAIN MEMO



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DPers Honored, Appointed

LOS ANGELES – Kenneth Pierce, director of systems design at the City of Hope National Medical Center in suburban Duarte, has been elected president of the Hospital Data Processing Systems Association.

The group disseminates information and ideas in hospital automation through monthly meetings and seminars. One of Pierce's first actions was commencement of a campaign to expand the group throughout the Southern California region.

The association is at P.O. Box 60218, Terminal Annex, Los Angeles, 90060

* * *

Robert M. Hart, chairman of the board of Boulder National Bank, has been elected to the Board of Trustees of the 52 Association. Hart has been active in the association's computer training program for wounded veterans.

* * *

Prof. J.C.R. Licklider, of MIT, now is chairman of the Data Communications Advisory Group of the American Federation of Information Processing Societies (Afips).

* * *

Nasa will send its Deputy Director of Flight Operations, H.W. Tindall, to keynote the fifth annual Australian Computer Conference next May.

Tindall has developed real-time computer facilities and programming for Project Mercury.

* * *

Thomas G. Doyle, of New England Telephone, is new president of the American Records Management Association, for a two-year term.

Management Art In DPMA Course

PARK RIDGE, Ill. – Better equipped and more effective managers is the objective of a new no-cost seminar program developed by Data Processing Management Association.

The program, entitled "business and management principles: a computer-based information systems orientation," comes in a package consisting of a text, made available free of charge to each participant, and a seminar guide for the instructor.

It covers three broad discussion areas: functions of a manager, hierarchy of needs in human behavior, and techniques of management. Information is available from 505 Busse Highway, 60068.

COMPUTERWORLD

societies/user groups

ACM Fall Seminars Teach Mini and Maxi Selection

NEW YORK – The Association for Computing Machinery (ACM) will present 16 DP seminars this Fall, as part of its Professional Development Program.

Slated for "key cities" in the U.S. and Canada, the seminar program will feature revisions plus two new courses:

- Minicomputer: Why, When, and How?
- Data Management System Appraisal and Selection.

The "selection" is based on the recently released technical report of the Codasyl Systems Committee, and will be taught by T. William Olle, former chairman of that committss.

Other new additions include Data Communications: Pitfalls and Potential, and Advanced Data Structure Design and Analysis. Both courses, elements of which have been presented, have now been revised to include new material and reflect advances in the state of the art, and new operating considerations, ACM said.

Other Revisions

Extensive revisions have also been made to the other three courses, on software acquisition, system performance measurement and analysis, and data entry.

A program brochure and additional information on these and other ACM seminars is available from 1130 Avenue of the Americas, 10036.

Calendar

Oct. 4-6, Memphis, Tenn. – Society for Advanced Medical Systems, **Annual Scientific Meeting.** Contact Pres. Dean F. Davies, c/o University of Tenn., 800 Madison Ave., Memphis, 38103.

Oct. 4-7, Chicago – Instrument Society of America, **26th Annual Conference,** and Data Handling & Computation Symposium. Contact: ISA, 400 Stanwix St., Pittsburgh, Pa. 15222.

Oct. 6-8, San Francisco – **Computer Micrographics Technology (Comtec) users semi-annual meeting.** Contact S. Manske, c/o Wellsco Data Systems, 425 California St., San Francisco, Calif.

Oct. 7-8, Washington, D.C. – Information Industry Association open forum on **Government Procurement of Information Industry Products, Services and Systems.** Contact Executive Director Paul G. Zurkowski, IIA, Suite 700, 1025 15th St. NW, Washington, D.C., 20005.

Oct. 11-13, Chicago – **Input/Output Systems Seminar '71** sponsored by the Data Processing Supplies Association. Contact: C.A. Greathouse, DPSA, P.O. Box 1333, Stamford, Conn. 06904.

Oct. 13-15, New York – American Management Association Seminar **Computer Auditing: Security and Control.** Contact: AMA, Inc., American Management Association Building, 135 West 50th St., New York, N.Y. 10020.

Oct. 14, Los Angeles – Association for Systems Management, Division 22 (Western Systems Council). 22nd Annual Western Systems Conference, theme: **Systems Proficiency – Direction to Success.** Contact James P. Townsend, Suite 800, 714 West Olympic Blvd., Los Angeles 90015.

Oct. 18-19, Tysons Corner, Va. – **DUA 6th Annual Conference.** Contact: Secretary, Digitronics Users Association, Box 113, Albertson, N.Y. 11507.

Oct. 18-20, Washington, D.C. – Hospital Information Systems Sharing Group (HISSG) Meeting **Government and Its Impact on Hospital Automation.** Contact: Dean R. Cannon, President, c/o Health Services Corp., 15 North West Temple, Salt Lake City, Utah 84103.

Oct. 18-22, Lausanne, Switz. – **Eurocon '71 Convention.** Contact: Eurocon '71 Secretary, 24 Chemin de Bellerive, CH-1007 Lausanne, Switz.

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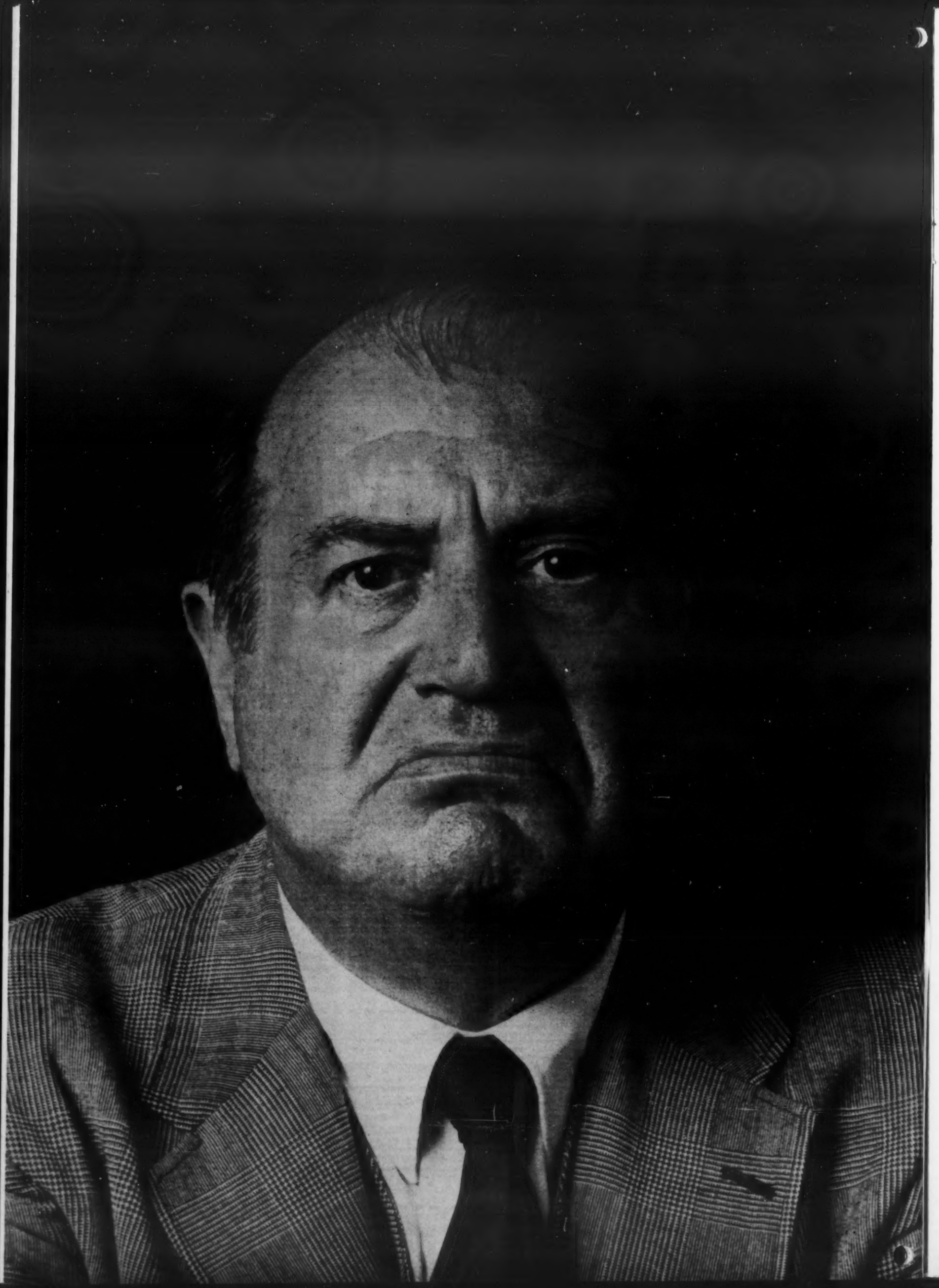

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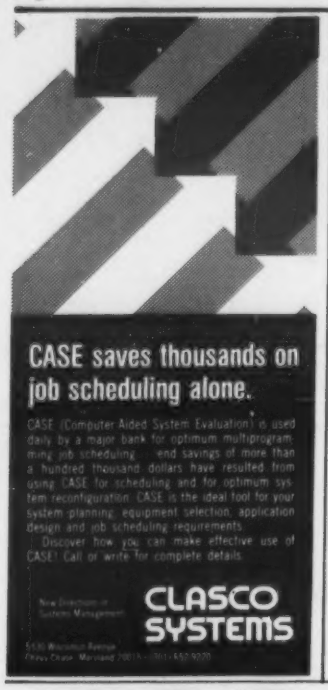
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Asis Waives Payment for Jobless, Regular, Student Dues Unchanged

WASHINGTON, D.C. – The American Society for Information Science "beat" the President by a week: the Asis Council announced Aug. 9 that dues would *not* be increased for regular or student members.

The group also operates a job placement service for its unemployed members. The service is run year-round by the Asis staff at headquarters here, and at annual conventions.

The society also waives dues by unemployed members who are unable to pay.

Behind the waiving of dues, and the maintaining of dues at the same level for employed members, is the fact that the society's financial status is "sufficiently healthy," an official noted.

"For most members of Asis and similar organizations," he added, "membership in a professional society is a personal expense." The last dues increase was effected three years ago.

The society is now in its 35th year of operation, and has a membership of about 4,000

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'Joint' Tradition Kept

FJCC Speakers Announced

LAS VEGAS – Tradition will be preserved at the Fall Joint Computer Conference, when an industry figure keynotes the meeting, and a more familiar public personality addresses the final-day luncheon.

Opening the three-day conference will be Dr. Arthur G. Anderson, vice-president and director of technical assessment for IBM's DP group.

Addressing the luncheon will be Dr. Frank Ryan, former professional football standout and currently director of information systems for the U.S. House of Representatives.

The conference, Nov. 16-18, is expected to draw up to 25,000 computer specialists, users, managers, educators, and industry representatives to the technical program and exhibits.

Conference general chairman Ralph Wheeler said Ryan's speech would discuss "new approaches to using data processing to assist congressional activity and performance."

Anderson will address the conference theme of Computers and the Quality of Life, the chairman added.

Anderson recently completed a year's sabbatical as a Visiting Fellow at the Center for the Study of Democratic Institutions, Santa Barbara, Calif.

The IBM technician said the jobs of engineers and scientists would be "very different in the future. We will be responsible for greater degrees of planning, greater appreciation of consequences of our work, and greater awareness of human values. Hopefully, we will lead."

Football fans recall Ryan as the man who defied superstition: he wore number 13 on his uniform when he finished his career with the Washington Redskins. Earlier, he had led the Cleveland Browns to the football championship in 1964. He is currently on leave from his position as associate professor of mathematics at Case Western Reserve University.

Conference chairman Wheeler said Ryan would give special attention to "changes in traditions and the adjustments the Representatives face in using new technologies."

Ryan will also participate in the regular technical program in a session on the uses of computer in sports.

SJCC Proceedings, Past Index Ready

MONTVALE, N.J. – Proceedings of the 1971 Spring Joint Computer Conference are still available from the conference sponsors, the American Federation of Information Processing Societies (Afips).

The federation said an Index of the spring and fall conferences from the beginning (1951) through 1970 is also available from Afips Press here.

The Index of volumes 1-37 costs $20. It can be obtained for half price by members of Afips constituent societies who send prepaid orders.

Last Spring's proceedings, which comprise vol. 38, are not yet indexed. The 631-page volume includes papers on the electoral process, education, and simulation, and costs $26 (half-price under the same conditions as the Index).

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Suits, News Items, DP Writings Comprise Legal Tool

By Edward J. Bride
Of the CW Staff

Materials and Cases on Computers and Law (Third Edition), by Roy N. Freed, Esq., 1971, 663 pages, $20, available from author, c/o Widett & Kruger, 1 Federal Street, Boston, Mass., 02110.

There's a wealth of knowledge here, too much for casual reading but indispensible when a business transaction involving computers, software, or services is anticipated.

The collection of writings and news items is of primary interest to corporate attorneys who must either write or approve computer contracts, but is also a valuable reference tool for DP managers and executives.

The book is not intended to be the final, definitive assemblage of computer-related legal issues, or legally related computer issues.

It is rather a compilation of more than 10 years' history of the evolution of computers in the legal process, intended to provide information and "provocative treatments of representative topics" regarding the possible use of computers in the legal, judicial, administrative, and legislative processes, and "the variety of legal considerations arising from the use of computers elsewhere in society," attorney Freed notes.

This third edition provides some more timely articles than the previous ones, and adds a more comprehensive table of contents.

Comments and questions are interspersed among the various reprints from trade publications in both the legal and computer professions, plus the *New York Times, Wall Street Journal* and major books such as Arthur R. Miller's *The National Data Center and Personal Privacy."*

Freed himself is well-represented in the reprints, from his lawyer's guide to computers in 1960 to his more user-oriented "Get the Computer System You Want" from a 1969 *Harvard Business Review.*

Among the most current documents is a copy of the search warrant used to confiscate the core dumps and tapes in the case of a West Coast programmer charged with stealing a proprietary plotting program from a time-shared computer.

The case is still involved in the legal process, and this points to a major concern of users and lawyers: computer law, just like usage and technology, is an evolving matter.

This book can bring users and attorneys reasonably up to date, but only continued vigilance can keep them current.

The volume also includes various articles regarding the inadequacies of computer contracts, long a crusade of Freed's and a concern of users.

Articles on patent/copyright protection for computer programs are also printed in the three-ring-bound volume and will need to be updated when and if the Supreme Court rules on the constitutionality of those software patents already granted.

Book Review

In his introduction to this edition, Freed comments he is "astonished by the paucity of my fellow professionals" who recognize how computers can be involved in their day-to-day activities, and the "rarity" of law school courses on the subject, "in the face of strong interest on the part of law students."

When enough attorneys recognize the need for communication and cooperation with DP managers and executives in planning computer usage, this may change.

Until then, Freed's future editions will be swelled by more lawsuits, more security and privacy breaches, more stories of unaware users becoming involved in strict and binding contracts, and other issues that comprise this volume.

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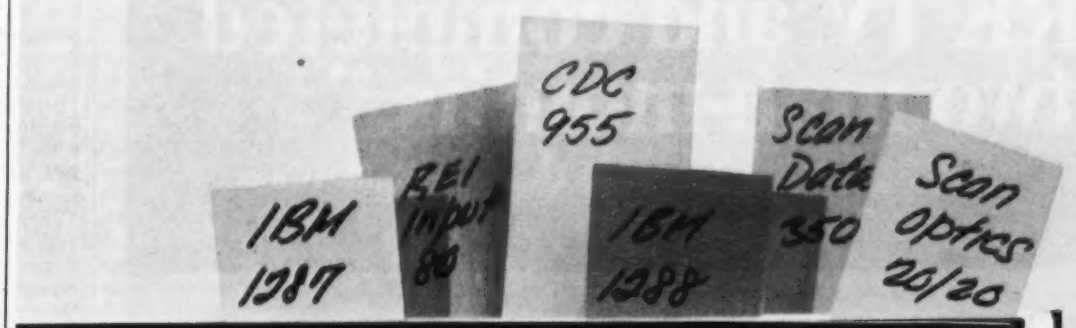

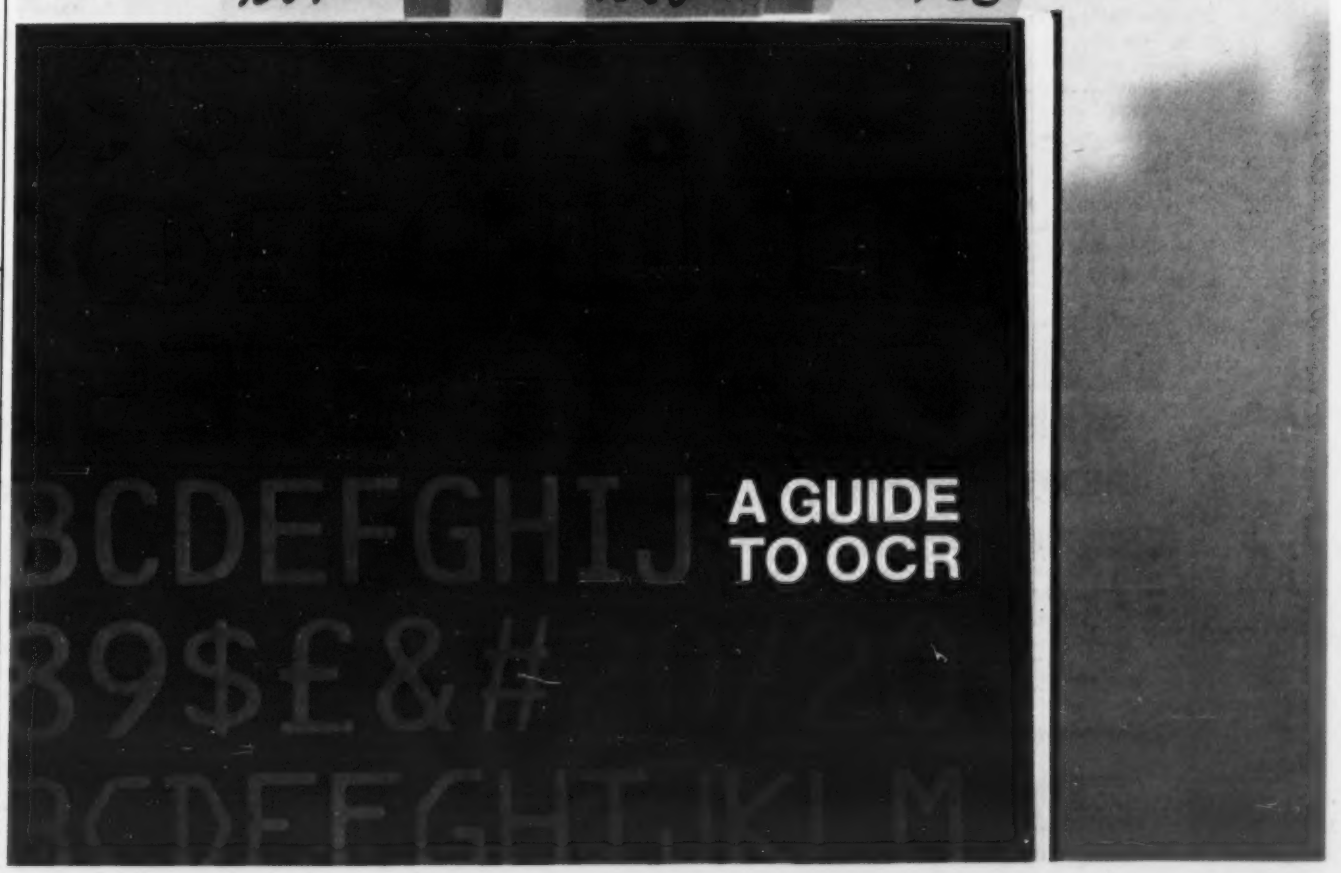

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Model to Predict Escaped Fish?

Special to Computerworld

SEATTLE, Wash. – How do you talk to a computer if you're in King Salmon, Alaska? And why would you want to?

Dan McKenzie, scientific programmer for the Fisheries Research Institute of the University of Washington College of Fisheries, knows the answer to both of those questions.

The answer to the first is "Plug in your portable terminal, attach your telephone to the acoustic coupler, and dial up." Just like home – except King Salmon is on Bristol Bay, at the base of the Aleution Peninsula, and the computer is in Richland, Wash., several thousand miles away.

And the answer to the second is "To process fisheries data leading toward the building of a simulation model to help the Alaska Dept. of Fish and Game."

The study, funded jointly by the Alaska Dept. of Fish and Game and a federal Sea Grant, will set up a data bank for Alaska, and sufficient statistical tools to allow the Fish and Game people to make management studies. One result of the study could be an automated system for establishing the opening and closing dates for fishing season.

Another result could be a model which predicts escapement (fish which swim past the catch area and reach the spawning grounds are said to have "escaped"), by multiple regression techniques. Early versions of the models, run from King Salmon, showed excellent correlation with historical data.

Dock Simulation Bags $60,000 But No Dock

SAVANNAH, Ga. – Union Camp unclogged a shipping bottleneck, and saved $60,000 in the process, by building a computer model of its loading dock operations.

When the plant, which produces over 35 million bags a day, began experiencing shipping delays because of increased demand, Union Camp industrial engineers mathematically simulated the paper bag shipping operation. The purpose of the simulation was to determine if a $60,000 allocation to build additional truck docks was justified.

Using IBM's General Purpose Simulation System, a detailed set of computer instructions that enables a computer to duplicate an operational process in mathematical terms, engineers entered such variables as numbers of trucks arriving per day, amount of goods shipped and truck-loading times per loading crew per dock.

The need was to shorten the time between the arrival of an empty truck at the gate and its departure fully loaded. The problem was further complicated by the unannounced arrival of customer driven vehicles. Delays in loading meant customer complaints.

Since arriving trucks always had to wait for any empty dock, Union Camp management had originally thought that building more docks was the solution and had requested $60,000 for that purpose.

In putting the model through the computer and varying the number of docks and crews, the simulation showed that putting more crews at the docks would be far more effective than adding dock space, and that the planned docks weren't needed.

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CW-5

Off-Line Printing Helps Chrysler Corp. Downgrade to 360/25

DETROIT, Mich. – Chrysler Corp.'s finance and personnel data processing section has changed from on-line to off-line computer printing to free its central processors for the logic functions for which they are primarily intended.

Because they no longer have to be prepared to store a large mass of data while the main-frame processor is being tied up in driving a printer, total core requirements have been reduced.

They were able to change from a 360/30 to a 360/25. By adopting the stand-alone printer system, a Satellite Printer supplied by Data Products Corp., they also eliminated the on-line printer and a tape-drive unit.

The section is responsible for processing the data for makeup of the complete corporate payroll – some 180,000 employees in all. Magnetic tape transmission terminals at each plant location feed hours-worked data for hourly and salaried employees to Chrysler's centralized computer processors.

File maintenance information, any changes in an employee's status, such as promotion, also are fed to the computer. The merger of these two types of tapes results in the printing of the payroll checks within 72 hours of the receipt of the data.

Unattended Computer Processes Blood Data

NEW BRUNSWICK, N.J. – A DEC PDP-11 computer system, costing approximately the same as one year's rental on the computer it replaced, is used by E.R. Squibb and Sons to increase greatly the number of high blood pressure reducing compounds it can test.

During the day, the compound being tested is administered to rats and the direct blood pressure is recorded on FM magnetic tape. At night, the tapes are read by the computer; the heart rate, systolic, diastolic, and mean pressures are determined at five minute intervals for 10.5 hours, and the resultant data are listed and plotted.

Random Notes

Net Modifies Xerox 'UTS' To Use More Remote Batch

REXDALE, Ontario – In an odd twist, Com-Share (Canada) Ltd., one of the current users of Xerox Data Systems' Universal Time-Sharing System (UTS), has released Com-Sys 1.0, which it describes as an extended version of UTS especially designed for Canadian needs.

The twist lies in the fact that Com-Sys 1.0 backs away from UTS's commitment to interactive time-sharing, and is geared for at least 30% remote batch-type processing. More details are available from Com-Share (Canada) at 41 Voyager Court North.

RPG Specifications, Other Data Shown on Stainless Steel Rule

HOUSTON, Texas – The RPG-Rule made of stainless steel and available from Hexco, Inc., P.O. Box 55588, 77055, provides column-by-column identification of the seven basic RPG specification sheets for use in reading card listings.

The $7 rule also includes Ebcdic reference data and scales for card volume, for 1/10 in. character spacing and for "6-to-the-inch" report line spacing. The company said it would engrave each rule, if desired, for $1.50 additional.

'Bi-Tran' Packages Control 360 CPU-CPU Communications

LOUISVILLE, Ky. – The Bi-Tran packages from Cybernetics & Systems Inc. are designed to provide binary synchronous communications between IBM 360 CPUs, with maximum utilization of core.

Bi-Tran I operates under either DOS or OS and uses 6K of core, including I/O buffers. Bi-Tran II is a stand-alone system that includes its own supervisor, and uses 12K of core. Bi-Tran I is licensed for $10,000 for either DOS or OS, while Bi-Tran II costs $15,000, from P.O. Box 1611, 40201.

Displayall/2 Gets New Feature

CANOGA PARK, Calif. – Informatics has made a Report Viewer special feature available for use with its Displayall/2 system for implementing CRT applications. The Report Viewer, for $3,500, allows the Displayall/2 user to roll lines, up or down, or to scroll them from left to right while viewing a report.

Users may also "turn pages," scan for selected data items and print selected pages through use of the Report Viewer feature. Informatics is at 21050 Vanowen St., 92303.

'Shas' Input Yields Drug Data

CINCINNATI, Ohio – A reporting program developed by the Franciscan Hospitals Data Center allows the center to extract data on drug usage from input to the IBM Shared Hospital Accounting System (Shas). The data complies with drug usage reports required by the Bureau of Narcotics and Dangerous Drugs.

The program can be modified to extract any identifiable data from the Shas input, the center said, and is available without cost to any user who is willing to share his programs with the center. The center can be reached through Box 14428, 45214.

Errors Can Be Graded

User Cobol Rules Defined By 'Mecca'

By Don Leavitt
Of the CW Staff

LOWELL, Mass. – DP managers can define the practices their staffs are to follow in writing Cobol programs, and use the CPU itself to check adherence to the desired practices, with the Monitoring and Enforcing Conformance to Cobol Administrative Standards (Mecca/Standards) package available from Arkay Computer Applications.

Mecca permits the definition of both positive and negative standards; that is features which must be present, or those which are not allowed. And Arkay can provide coding to prevent the Cobol compiler from handling a source program that has not gone through Mecca.

Mecca is based on a series of control cards within which some 200 standards can be defined. These range from source program sequence numbering and identification requirements, through definitions of what is acceptable, or unacceptable, in each of the divisions of the Cobol program being monitored.

Under Mecca, for example, the DP manager can define which Cobol reserved words are not allowed in the procedure division, what entries must be in the file control section, and how the data division must be structured.

The manager chooses the standards he wishes enforced. Beyond that, he can assign differing severity codes to the practices he wishes enforced, so that the user is made aware of which errors, if any, in his program are considered the most serious.

Mecca generates a source program listing, much like the one produced by the Cobol compiler, but with English language error messages marking those statements that violate any of the defined standards.

Mecca also accumulates statistics on the violations, by programmer, program and error type, and generates a summary each month for management review. This management report is produced, without operator action, the first time Mecca is used each month.

Mecca is, itself, written in Cobol and BAL and is available for use under either DOS or OS/360. It is available for a one-time charge of $1,800, from Arkay at 170 Merrimack St., 01852.

Programmers Skip Btam Coding Through Use of Franklin's 'Tom'

SPRINGFIELD, Ill. – DOS/360 users will have still another communications monitor available to avoid a direct confrontation with IBM's Btam, with the recent introduction of the Teleprocessing On-line Manager (Tom) system from Franklin Data Services Corp.

Tom provides the interface between application programs, which can be written in a variety of languages, and the telecommunications network.

Thus Tom relieves applications programs of terminal handling and other systems functions. The system supports on-line processing, inquiry and updating, and features extensive error handling.

Tom is written in BAL and uses DOS/Btam and will support IBM 2260 CRTs and IBM 2740 typewriter terminals. It can be modified to handle other Btam supported units, according to Franklin.

The design of Tom is described as open-ended, allowing implementation of new applications or terminals.

Tom will run on any 360/30 or larger CPU with a 40K foreground partition, under the current release of DOS. Minimum peripheral equipment required by the system includes a 2400 series tape drive and a 2311 disk drive in addition to card reader, printer and keyboard.

Tom is available for a purchase price of $7,500, which includes on-site installation support by Franklin personnel.

Franklin Data Services is in Franklin Square, 62705.

'DOS/Audit' Controls Libraries

CANOGA PARK, Calif. – DOS/Audit. from Associated Computing Services Inc. (ACS), provides DOS/360 users with more exact control over their core image, relocatable and source libraries than they have with IBM-supplied software, ACS said. DOS/Audit is an advanced Dserv with several improvements, the most notable of which is the date of cataloging, according to ACS.

In a DOS/360 environment, the user may catalog program modules to the various libraries, but unless the work is done carefully, it can lead to a variety of control problems, a spokesman explained. Some of the problems can be resolved by use of the IBM utility Dserv with slight modifications, he admitted, but added that DOS/Audit goes further than the standard Dserv capability.

DOS/Audit will list each module cataloged, in name sequence, and show name, date on which it was cataloged and, in the case of the core image library, the amount of core necessary to execute a specific phase.

The ACS package will also list each new, deleted, or renamed module on the library since the last DOS/Audit run, in name sequence, showing name, date of the addition, deletion or renaming, and the date of the prior module if there is a recataloging.

The $750 package will operate on any 360/25 or larger CPU, using DOS. It requires approximately 22K bytes of core, and takes approximately a minute longer than the standard Dserv, ACS said from 20944 Sherman Way, 91303.

Users Gain Supervisor Choice Under 'Multi-DOS' From ACS

LYONS, Ill. – Multi-DOS, a program that allows the user to have several different DOS/360 supervisors cataloged in the core image library at the same time, is available from General Electronics for a one-time charge of $50.

By providing a choice of supervisors, Multi-DOS allows the user to install and test a new supervisor without having to rebuild the system's pack if it cancels. An alternate supervisor can be selected and the normal processing continued with minimum interference, a spokesman said.

In addition to providing a means of testing new supervisors, Multi-DOS also provides a means of having several operational supervisors, each tailored to a special purpose.

Multi-DOS is said to operate on any system that supports DOS. It requires only 200 bytes of core

General Electronics can be contacted through P.O. Box 79, 60534.

'Case IV' Speeds Simulations

CHEVY CHASE, Md. – Case IV, an enhanced version of the computer simulation package from Clasco Systems, is said to be much faster than previous versions. A typical simulation requires less than five minutes on a 360/50, Clasco claims.

Case IV is machine independent and is currently operational on 256K, 360/370 OS configurations, and in 65K on CDC 6000, Univac 1100, or HIS 600/6000 series CPUs. The user may simulate virtually any CPU, regardless of the host machine. Case IV is available for $10,000 and up, from 5530 Wisconsin Ave., 20015.

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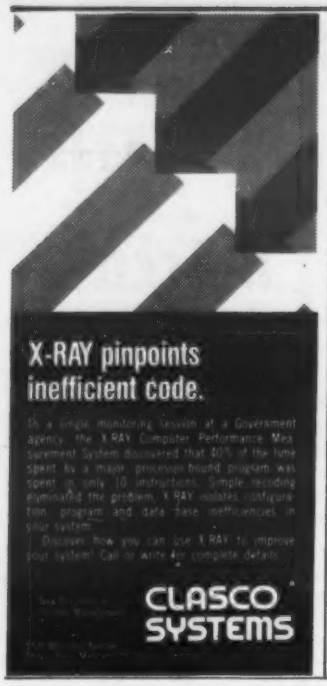
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CEs Tell Problems to CPU

RALEIGH, N.C. – IBM customer engineers servicing the company's communications equipment anywhere in the country now can "talk" with a computer at the Teleprocessing Test Center here.

The coupling of experimental speech recognition and audio response techniques through a system called Automatic Call Identification (ACI) makes the two-way conversation possible.

This application in direct man-machine communications is the first IBM speech recognition system designed to operate over telephone lines and respond to a range of different voices and accents. Most speech recognition systems will respond to, or recognize, only a limited number of voices, IBM said.

ACI automatically answers, identifies and directs incoming calls for customized testing of specific types of terminals.

Through ACI, the customer engineer responds in a normal tone of voice to questions programmed in the computer. His answers direct the computer to select the specific terminal testing routines required.

The system is programmed to recognize one word at a time, signaling the caller with an audible "beep" when it is ready for the next word. The computer recognizes words by comparing them with a stored set of several variations of a 13-word vocabulary. It is programmed to understand the spoken numbers 0 through 9, and the words zero, yes, and no.

Communications

Michigan Bell Uses Minis To Improve Order Entries

DETROIT, Mich. – Minicomputer-directed order entry systems are helping Michigan Bell Telephone Co. service 700,000 greater Detroit customers more efficiently and more economically.

The nine order entry systems designed by Sanders Associates, Inc. have reduced order backlog, training time and costs and increased order accuracy, efficiency and flexibility, Michigan Bell said.

Each order entry system consists of three Sanders 720 display terminal units with keyboard control, a Lockheed MAC 16 minicomputer with an associated drum storage unit and a teletypewriter.

Seven residential areas with some 600,000 customers, and two business sections, comprising about 75,000 customers in the east and west portions of Detroit, are being serviced by the systems.

Business orders are complex and very often quite varied, Michigan Bell explained, and the system enables the order writer to electronically correct and amend an order, and eliminates the time-consuming process of changing a printed card.

With 70,000 orders being processed monthly, the system's efficiency factor has been close to 98%, Michigan Bell said.

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Data Briefs

Anderson Jacobson Modem Handles CPU End of Line

SUNNYVALE, Calif. – Anderson Jacobson Inc.'s new Series 12 is designed to receive and transmit data at the CPU end of the line. Previous AJ products have been terminal-oriented.

The Series 12 is a multiple modem system consisting of card-rack chassis, power supplies, modems and Data Access Arrangements (DAAs). Any combination of modems, including Bell 103A/E, 103F and 202 C/D or equivalents, can be accommodated, the company said. The price per channel is $308, from 1065 Morse Ave., 94086.

Elgin Coupler Includes DAA, Saves Equipment From 'Bounce'

WATERFORD, Pa. – A new data compiler, the EDC1001A from Elgin Electronics Inc., connects customer-provided data equipment to the switched network. The coupler includes both the DAA and Network Control Signaling Unit as described in appropriate tariffs, the company said.

The unit is said to be designed for terminal equipment that cannot tolerate the contact bounce and radiation electromagnetic associated with contact closure devices. Elgin said the unit protects both user and network equipment. Elgin is on Walnut St., 16441.

General Datacomm Modems Bow

NORWALK, Conn. – General Datacomm Industries has introduced the 103F Multimodem asynchronous modem for data transmission of up to 300 bit/sec over private lines. The company also unveiled the 402C Multimodem that can send data on eight lines at an effective rate of 600 bit/sec over the public switched network.

Field select options on the 103F provide for either Answer or Originate mode. Both the 103F and the 402C are available through Graybar, General Datacomm sources said.

WU Adds TWX Service

NEW YORK – The first new service feature offered since Western Union acquired TWX permits customers to send overseas messages toll-free to gateway cities of international carriers by relaying them through its international message center in Greensboro, N.C.

Bits and Pieces

Choice of Screens, Options Available With $78/Mo CRT

SOUTHFIELD, Mich. – A new entry in the low-cost CRT market, Interactive Terminal Corp.'s 4380 Communications Terminal displays 40 or 80 char/line in 10 or 20 line displays, and rents for $78/mo. Options on the terminal include answerback, integral modem, lower case characters, light pen, interfaces to other peripherals, acoustic couplers, and video monitors. There are also four screen sizes.

The 4380 transmits at up to 4,800 baud in either parallel or serial. Interactive Terminal is a subsidiary of Bendix Corp. in Southfield, Mich., 48076.

Datagraphix Recorder Handles COM Alphanumerics, Graphics

SAN DIEGO, Calif. – Stromberg Datagraphix has introduced a COM recording system, the 4460 Business Graphix Recorder. It produces high-speed alphanumerics and graphics, and does phototypesetting, the company said.

A complete software system is supplied with the recorder, including graphics and processing and utility programs. The sale price of the recorder is $150,000; first deliveries have already been made. Stromberg Datagraphix is at Box 2449, 92112.

Many CPUs Support Display Unit

SUNNYVALE, Calif. – The Data Disc 6500 graphic display system has been interfaced to a large number of mainframes, including the IBM 1800 and 360/2701, the HIS 316 and 516, the DEC PDP-8e, and Hewlett-Packard, XDS, Interdata, Data General, and CDC units.

A 16-terminal system, with video generator, disk refresh, interface, CRT and keyboard costs about $4,000/terminal. Data Disc is at 686 W. Maude Ave., 94086.

PDP-15 Can Use Add-on Memory

WALTHAM, Mass. – An add-on core memory for the PDP-15 minicomputer is available from Dimensional Systems. The company said a typical 32K block would cost $25,000, installed. The 800 nsec core comes in a box with room for from 16K to 65K of 18 bit bytes. The PDP-15 is a 16-bit machine, and the add-on electronics recognize an 18-bit address, allowing index registering of 131K. A boundary register locates the add-on above main memory. Dimensional Systems is at 393 Totten Pond Road, 02154.

Techniques Differ

More Double-Density Disks Available

By Michael Merritt
Of the CW Staff

System/360 users now have four double-density disk drive systems to consider, with announcements by Memorex and Telex for 2314 replacements. Marshall Data Systems and Calcomp have already introduced units.

The 3665 system from Memorex provides 480 Mbytes on-line through use of a new recording technology. By doubling the density of linear data recording, Memorex said it has been able to maintain 200-cylinder, "wide-track" recording and reading, and to support OS/360 as a native device, while achieving an average access time of 35 msec.

The Memorex units have twice as many bits per track as conventional recording. By cutting the rotational speed in half, to 1,200 RPM, however, they maintain a transfer rate of 312 bytes, which is compatible with the IBM 360 line, the company said.

Rather than changing the track width, Memorex changed the encoding algorithm to double the recording density per track. Although the new algorithm has simplified the technique used to record each bit, spokesmen said it maintains the same degree of data integrity as the IBM-style algorithm. None of the parameters of external head positioning and pack technology were changed, they noted.

The Memorex 3665 controller leases for $1,400/mo, and the disk drives for $400/mo each. The ninth drive on the 3665 is available for $125/mo, a spokesman added.

Memorex is at San Tomas at Central Expressway, Santa Clara, Calif., 95052.

Telex Marketing 5600

Telex Computer Products is offering a double density disk storage system, dubbed the 5600, made by Information Storage Systems.

Telex follows the normal route of doubling the number of cylinders available on 2314-type drives, cutting the width of the recording tracks on the disks in half. This gives the system a capacity of 58 Mbytes per drive, or 466 Mbytes for a full, eight drive-plus-spare system.

By using electronic positioning the Telex drives also have a faster access time than the 2314 types. Average access time is 29 msec, compared with the IBM time of 60 msec, Telex said. Minimum access time has been lowered from 25 msec to 7 msec.

The 5600 avoids possible arm contention and pack mounting problems that arise with a two volume per drive approach by treating each drive as a single 406-cylinder volume, Telex said.

Since the dual density drives are not software-compatible with IBM operating systems, Telex said it would provide OS and DOS modifications to users at no charge.

The company said the improved access times were the result of a closed loop servo system that controls an electromagnetic actuator.

The 5650 controller leases for $1,475/mo, plus $75/mo for maintenance. Purchase price for the controller is $56,050.

The 5625 drives can be bought for $15,010 each, and they lease for $395/mo plus $60/mo maintenance.

Telex is at 6422 E. 41st St., Tulsa, Okla., 74135.

Remote Programmable Terminals, Small Cassette-Based CPU Debut

CONCORD, Calif. – Eldorado Electrodata has added three models to its line of remote batch terminals. Called the 120 series, two of the units, the 123 and 124, are multiprogrammable.

The two utilize a 4K core memory, a 300 card/min reader, and either a 135- or 600-line/min printer. The 125 is programmable and has two magnetic tape cassettes, a 4K memory, an IBM 735 Selectric typewriter, and either a synchronous or an asynchronous controller.

The 125 may also be used as a stand-alone computer, the company said.

Options for the line include tape cassettes, IBM-compatible 7- or 9-track magnetic tape drives from 200 bit/in. to 800 bit/in., up to four 5 Mbyte disk drives, card readers, line printers, and paper tape equipment.

Software for the series includes emulators for the IBM 2780, the Univac 1004 and DCT-200, and the CDC 200 User remote batch terminals. There is also an ASR-33 teletypewriter emulator.

A transitional monitor, a test operating system, an assembly program, and a programming language are also available.

Eldorado has also configured a small office computer system, the Model 140, around an 8K to 61K byte mini. The 140 has three tape cassettes, and the same line of optional peripherals and system software as the 120 series terminals.

Applications software for the 140 is custom designed. Delivery for all the units ranges from 60 to 90 days. The 140 has a base price of $18,750, while the terminals cost $17,050 for the 123, $24,500 for the 124, and $15,500 for the 125.

Eldorado Electrodata Corp. is at 601 Chalomar Road, 94520.

Non-Impact Printer Creates Forms

EAST HARTFORD, Conn. – Scan-Optics' non-impact, high-speed line printer enables users to print forms entirely on the printer rather than inscribing on pre-printed forms.

The 1,200 line/min unit lets users "easily change fonts or character styles, and permits them to generate directly from the printer an unlimited number of types of business forms," a company spokesman said.

Called the X/3, the printer has a 96-char. set, prints 132 columns, and produces OCR-readable characters. In one configuration it is actually on-line to the Scan-Optics 20/20 OCR. It also operates as a stand-alone print station with a controller, IBM-compatible tape, and computer.

The printer uses ordinary fanfold computer paper for high quality printing, the company said, and does not require any specially treated stock.

Sales price for the printer will start at $20,000, and leases will begin at $600/mo, including maintenance. Interchangeable character masks and higher speed capabilities will also be available, Scan-Optics said.

First commercial demonstrations of the machine are scheduled for October, and deliveries are anticipated in early 1972.

Scan-Optics is at 22 Prestige Park, 06108.

Two Portable Units Bow

SANTA ANA, Calif. – Compro Corp.'s two portable impact printing communications terminals operate at either 30 char/sec, or 10/15/20 char/sec. The units print 80 char/line, and the keyboard generates standard Ascii code.

The terminals weigh 25 lb, and meet airline carry-on requirements. Features include parity detection, off-line operation, horizontal and vertical tab, and bi-directional paper drive. The 30 char/sec unit costs $2,950, while the slower mode costs $2,200 from 127 E. Dyer Road, 92707.

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New, Big IBM Users Have Opportunity to Innovate

By Edward J. Bride
Of the CW Staff

ARMONK, N.Y. – Users of big IBM machines like the 360/65 or its timesharing brother – the 67 – have rather unusual side benefits when first installing their leased computers:

- Unlimited off-shift test time during the first 90 days
- Up to a full month's prime-shift test time, depending on configuration
- Conversion from pre- to post-installation test time, if the manufacturer does not have a system up and running in the area.

This last capability is especially important with potential 67 users, since IBM test facilities with model 67s are few and far between. The considerable hours of test time were explained during a CW investigation of one user's claim that test time was being used to perform actual productive work.

'Against Guidelines'

IBM said it was "absolutely against marketing guidelines" to permit users to convert this test time to actual production, and that users were "obligated" to report the completion of the test phases of new installations, so rental fees could commence.

IBM admitted there is little "policing" of this policy, however, adding customers often report their own meter time during the normal course of a production month on a leasing contract.

An IBM official also said users with a model 67 currently installed, but waiting for a 370-series timesharing operating system before upgrading to the newer models, could take advantage of the long-term leases for peripherals.

The Fixed Term Plan (FTP) calls for reduced lease prices on certain peripheral gear if the user is willing to sign a two- or three-year contract. Since these peripherals are reportedly upward-compatible, a user could sign the FTP lease for them, while maintaining the month-to-month plan for his CPU.

No 370 Equivalent

There is currently no CPU in the 370 line which can accommodate 360/67 timesharing users. A model 67 under OS could be upgraded, but the TSS – timesharing system – currently has no 370 equivalent.

IBM would not comment on speculation that research into the required systems software for a 370 upgrade is being carried out at the company's Cambridge Scientific Center.

Cash Credit

Regarding a claim that unused test time on a 67 had been offered for cash credit, IBM said it doubted the possibility, noting the test time is to facilitate new installation, and definitely not for credit, and not for productive work.

The company said a user's contention that a salesman had offered a cash credit for unused test time or an extension of actual test time probably stemmed from a conversion of unusable pre-installation test to on-site post-installation testing. The users involved, neither of whom could be identified, are both located in New York, where IBM said it had no facility for testing 360/67 conversions.

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Information gathered at an experimental vehicle inspection station will be used by the Department of Transportation to increase the effectiveness of the automobile manufacturers' recall campaigns, to set new safety standards for the industry, and to find ways to eliminate excessive engine emissions.

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Computer Calculates Electron Densities

AMES, Iowa – Chemists at the U.S. Atomic Energy Commission have written a new computer program for crystallographic Fourier calculations, based on the fast Fourier algorithm. By the use of this program the usual Fourier maps can be computed in about one fifth the time required by standards methods, they said.

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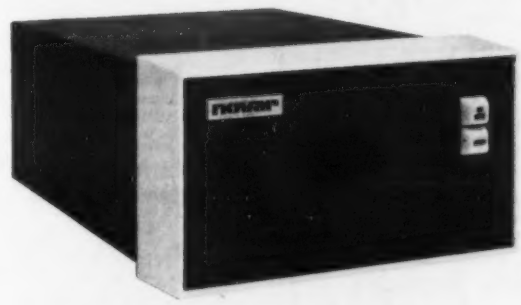

This is the Novar Touch Tone Translator that permits touch tone telephones to be used as remote entry keyboards. It can be used with any Novar terminal equipped with a tape recorder. The Model 5-10 sells for $990, rents for $30 a month including service.

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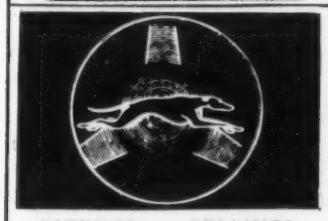

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STARTING in the Sept. 29 issue of Computerworld, a new classified advertising section called "Things Wanted," designed to reduce the cost of advertising for individuals and small companies.

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THINGS WANTED advertisements are accepted for anything wanted. Full payment must accompany your order. Computerworld reserves the right to edit to our style. Multiple-insertion ads may be cancelled at any time and be charged only for the number of insertions actually printed (Cancellation notice must reach us at least 13 days prior to issue date).

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September 22, 1971

CI Notes

Joint Booths at 600

LAS VEGAS, Nev. – The fast-paced days of old haven't returned to the Joint Computer Conferences. Latest booth count for the Fall show is 600, about the same as SJCC, with 175 exhibitors planning to show. Goal was 750 booths and about 250 exhibitors.

Two years ago in Las Vegas, the FJCC drew over 900 exhibitors, and had to be split into two locations to handle the spillover. Weeks later, Afips announced a 1,000-booth limitation on future conferences.

Navy to Buy DOT Memory

NEWTON, Mass. – The U.S. Navy has awarded a $95,000 contract to Cambridge Memories Inc. for the development of a block-oriented random access memory using the magnetic domain tip technology (Dot) that is similar to the "bubble" memory concept.

The contract calls for the delivery of two 16-bit, 2K word memory systems to the Naval Air Development Center at Johnsville, Pa., by mid-1972.

BR Reports Planar Breakthrough

WESTLAKE VILLAGE, Calif. – Bunker Ramo Corp. has announced "potentially a significant breakthrough" in the development of computer memory planes in its proprietary "Planar Coax" packaging.

The firm said testing is "nearly complete" on 4 in. by 4 in. planes about .03 in. thick containing 512 words by 18 bits of plated wire memory.

Supershorts

Redcor Corp. has installed three 20-terminal KeyLogic systems for the State of California, Department of Human Resources Development, after an evaluation period in which more than 99% uptime on the KeyLogic systems exceeded the specified requirements.

– – –

The General Services Administration has awarded a Federal Supply Schedule to Data General Corp. for the purchase of Nova 1200, Nova 800, and Supernova computer systems.

– – –

Computer Automation, Inc., has expanded its international operations with formation of a wholly owned British subsidiary, CAI, Ltd., in London.

– – –

The General Services Administration has added to its Federal Supply Schedule the DUO/360/370 software package developed and marketed by Computer Technology Inc.

– – –

Cipher Data Products has landed a $10,000 order from Spiras Systems Inc., a subsidiary of USM Corp. for the C-200 dual cassette recorder system and a $100,000 order from Word Processing, Inc., Hagerstown, Md.

– – –

Advanced Memory Systems, Inc., has signed a contract with Itel Corp. providing for the purchase by Itel of AMS add-on memory systems for IBM 360/65s. Itel has the exclusive right to market these systems through June 30, 1976.

Change in Direction

Digital Plans Marketing for System 10

By E. Drake Lundell, Jr.
CW Computer Industry Editor

MAYNARD, Mass. – The introduction of the DECsystem-10 represents a change in marketing philosophy for Digital Equipment Corp. (DEC) with emphasis on penetration of the commercial and industrial areas in the large systems field, according to Rod Belden, market planning manager for the system.

And growth in these new areas could account for as much as 50% of the new business of the firm in the future, Winston R. Hindle, Jr., group vice-president, adds.

At the same time, however, DEC's entry into the commercial area is not a head on attack against IBM, but rather a limited thrust aimed at specific applications areas, Belden said.

Presently large DEC systems are strong in the educational and scientific fields, which account for about 70% of its large systems business, and in the data services area which accounts for between 15% and 20% of DEC's large system sales. The remaining 10% to 15% of large system installations are in the commercial and industrial areas.

This picture should reverse dramatically within the next two years, Belden said, with the commercial and industrial markets accounting for at least 50% of the firm's sales in large systems. The education market should account for 20%, as will the scientific field, and the data services market should drop to around 10% of the sales.

The commercial and industrial areas have the best long term growth potential, Belden said, and would complement the firm's other business.

He noted that growth in the minicomputer market (DEC's forte) had been extremely strong in the past five years. For the firm to continue the same type of overall growth, it needed to widen its base by entering new market areas, he said.

Traditionally the large systems business has represented about 20% of the overall business of DEC, he said, but that this percentage was expected to edge higher if the firm meets its goals of a 50% increase in sales of large computers during each of the next two years.

At the same time, DEC will not "try to be all things to all people" in the commercial and industrial areas like most of the other large mainframe makers, Belden indicated.

He said that DEC was aiming solely at the high end of the market – the large sophisticated user is capable of some applications programming himself and who can project their computer needs over several years.

"It would not be feasible for us to go up against IBM across the board," Belden said, "because we do not have the finances, sales or service support they have available."

Instead the firm will go after well defined market segments within the general business and industrial fields, he said.

The limited approach can be seen in projected orders over the next few years – 50 to 70 system orders this fiscal year (ending June 30) and 75 to 105 orders in the next 12 months, sources at the firm indicated.

DEC also expects to see a large growth in the concept of distributed computing, and sees combinations of DECsystem-10s and PDP-11s meeting needs in this area, Belden said. The firm is working on a common approach to operating systems for 11s and the larger machines. Presently they can be interconnected through high-speed synchronous communications channels.

U.S. Rejects Japan's Move to Cut Computer Import Barriers

By a CW Staff Writer

WASHINGTON, D.C. – Japanese officials agreed to lift that country's quotas on computer equipment in recent cabinet level meetings here and the move could be a boon to U.S. firms that decided not to cross license their technologies with Japanese companies.

While the Japanese liberalization offer was rejected by U.S. officials as not going far enough (it only covered eight other export items), officials here considered it a "hopeful" indication that the Japanese could be persuaded to reduce some of their import restrictions on U.S. goods.

The offer was made in hopes of getting the U.S. to lift the 10% surcharge on imports, and was rejected by U.S. officials who want many more items liberalized as well as a re-evaluation of the yen.

One bystander who could take heart from the apparent easing of the Japanese feelings on computer trade would be Digital Equipment Corp., which has not signed any cross-licensing agreements with Japanese manufacturers.

Speaking in Boston, DEC President Kenneth Olsen said that a cross-licensing agreement might have generated a couple of million dollars for DEC in near term revenues.

But, he added, "there is a gamble involved. The rule is in this year. Will it be in effect next year or two years from now? Maybe not, and we would have given away an opportunity for a couple of million."

Social Security Seeks Computer Contractors

CW Washington Bureau

BALTIMORE, Md. – The Social Security Administration is seeking "qualified companies" to handle its computerized hospital insurance part of the medicare program.

SSA has asked for preliminary proposals from "firms having professional and technical capabilities that cover a broad spectrum ranging from management planning to detailed technical knowledge of hardware and software technology for conducting a maintenance and development program at a broad conceptual level."

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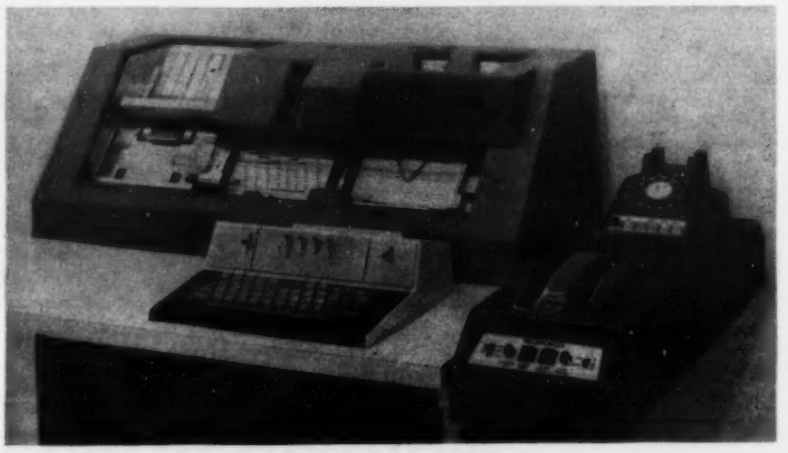

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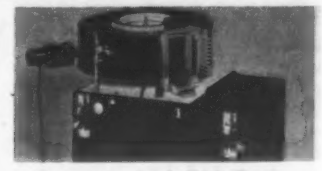


Computer-Link Disk Tester

SOMERVILLE, N.J. – RCA's new developmental reflective- and transmission-type liquid crystal readouts are designed for numeric display applications.

The units, which can be interfaced with the RCA COS/MOS integrated circuits, will be available for sampling during the last quarter of 1971.

The TA8032 (transmission type) and TA8034 (reflective type) are single-digit, 7-segment readouts to be used to reproduce graphic data. The TA8041 and TA8043 (transmission types) and TA8040 and TA8042 (reflective types) are 4-digit, 7-segment readouts.

Prices will be $25 for the TA8032 and TA 8034; and $75 for TA8040 up.

Narrow Track Recording Heads Bow

GOLETA, Calif. – Information Magnetics Corp. has introduced a new series of narrow track recording heads designed for writing and reading data on oxide coated disk packs.

The Model 2200-NT flying head is intended for use with double density disk packs, writing 200 track/in. at 2,200 bit/in. Track width is .0035 in. and operating frequencies are 1.25 MHz and 2.5 MHz nominal. Output signal is 1 mv.

Specifications are available from the firm at 5743 Thornwood Drive, 93017.

Paper Tape Reader Debuts

BROOMALL, Pa. – A TTL-compatible paper tape reader using photoelectric reading sensors, a solid-state LED light source, and a single stepper motor is now available from Adtrol, Inc.

The AR10 reads standard paper tapes in either direction at speeds to 75 char./sec. Information is available from the firm at 700 Abbott Drive, 19008.

Cassette Drive Called "Reliable"

VAN NUYS, Calif. – Interdyne's Model IC/2500 data cassette tape drive features a single servo-controlled capstan motor and a pair of individual reel motors, resulting in mechanical reliability, the firm said.

Data can be recorded synchronously by record at rates up to 9,600 bit/sec or incrementally at up to 30 char./sec. It provides bi-directional write/read at either of two programmed speeds between 2 in./sec and 12 in./sec.

The IC/2500 records single track serial data, phase encoded at a packing density of 800 bit/in.

The unit is available as a single-gap-head write/read unit for $995 or in a dual-gap-head read after write configuration for $1,200. OEM discounts are available from the firm at 14761 Califa St., 91401.

CRT Display Terminal Marketed

EL SEGUNDO, Calif. – Wyle Computer Products has entered the CRT terminal market with a clustered display system.

The Series 8000 interfaces up to 16 Wyle CRT displays to a single Wyle controller which can communicate with remote computers over voice-grade lines at speeds up to 9,600 bit/sec.

The 8000 system features two screen sizes (480 char. or 960 char.), non-destructive cursor, and a colon seeking tab. A cluster of 16 series 8000 CRT display terminals and a controller is priced between $30,700 and $39,900, depending on quantity discounts, the firm said. Wyle is at 128 Maryland St., 90245.

Four Magnetic Heads Enter Market

HICKSVILLE, N.Y. – Magnusonic Devices is readying four new magnetic heads for tape and disk systems for introduction.

The new units will include new 200 in./sec heads, new 1,600 bit/in. heads, and new multi-track flying heads, in addition to a full-line option of non-external-shield heads. The firm is at 124 Duffy Ave., 11801.

New OEM Products

Bucode Offers Formatters

HAUPPAUGE, N.Y. – Formatter units are available from the manufacturer for the Bucode 2000 series of tape transports.

The units, offered in both NRZI (7- or 9-track) and phase encoded configurations, permit the same controller to be used in both NRZI and PE applications.

The units implement all of the basic tape transport control and formatting functions, including parity checking/generation, stop-start motion delays, IRG generation, Bucode said. Delivery is 30 to 45 days from the firm at 175 Engineers Road, 11787.

MK-29 Keyboard Announced

BURLINGTON, Mass. – The Model MK-29 keyboard from Data Electronics Corp. is available in a standard keypunch configuration for use in keypunch replacement equipment.

The unit features L-shaped keys and single-crossbar wiping action contact, in addition to an automatic current-limiting technique. The units typically draw 180 mA from a single 5 V power supply.

The standard device includes 51 keys, encoded and function keys, two-key rollover, error and data lockout, and a DTL/TTL compatible interface, the firm said.

Disk Pack Inspector Out

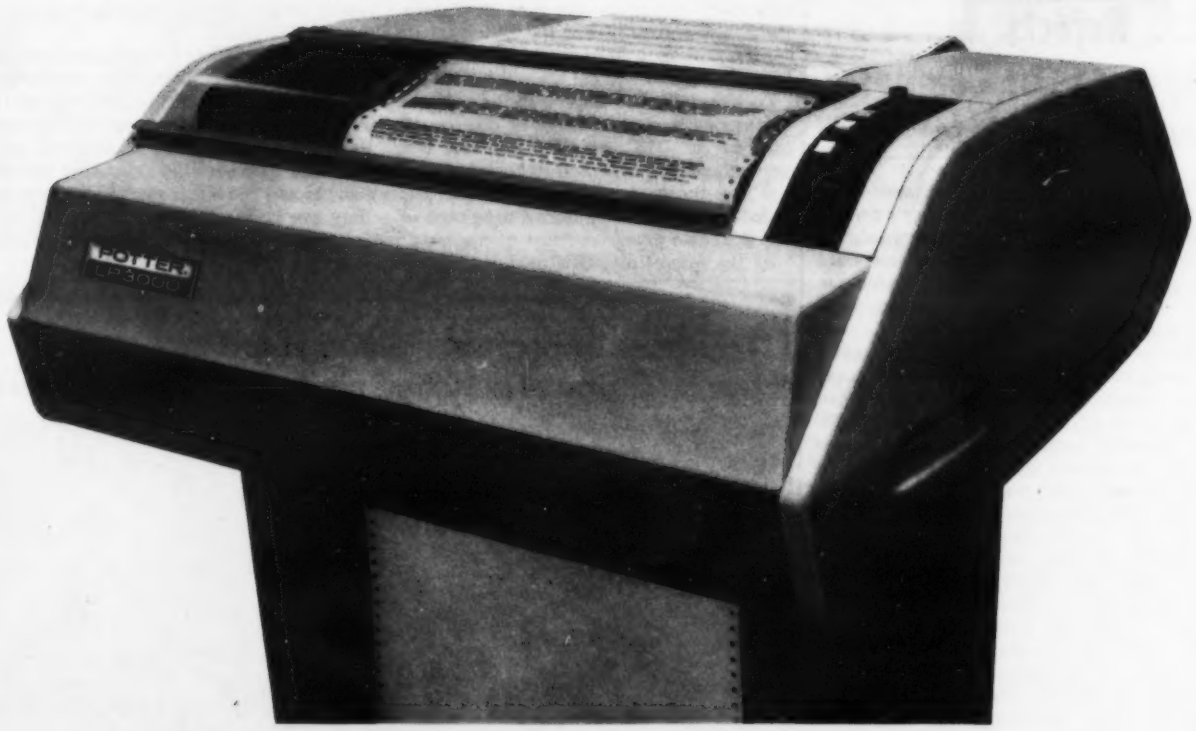
BURLINGTON, Mass. – Computer-Link Corp.'s new disk pack inspector checks an IBM 1316 or 2316 style disk pack for tolerances including axial and radial runout of the sector disk, axial runout of all data disks, and radial runout of the trim strip.

When cleaning is required, the unit is equipped with front-surface mirrors to inspect each data disk surface and a columinated light source for location of surface scratches. The Model 650 disk pack inspector can be used on both 6-high and 11-high packs, said the firm at 14 Cambridge St., 01803.

Rome Seeks Bulk Memory

ROME, N.Y. – Rome Air Development Center, Griffiss Air Force Base, is seeking research and development sources to design a bulk memory of 10^9 bits using magnetic bubble technology. The memory is to be the non-mechanical equivalent of conventional disk or tape data storage.

A new concept in durable line printers and plotters.



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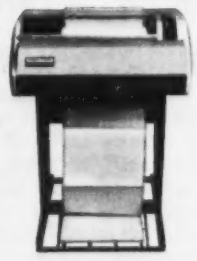
The Potter LP 3000 series printers have been designed for maximum reliability. The mechanical simplicity of these units lets them operate day after day without maintenance. For mini-computer data systems or terminals, the Potter LP 3000 and LP 3300 offer the lowest cost, high performance line printers available. These two outstanding products feature a unique printing principle which provides clear, sharp multiple copy printout.

LP 3000 – Prints 135 lines per minute with 64 characters on 132 columns. Its sharp, clear multiple copy printout makes it ideal for mini-computer or data terminal use. It is available now at just $3,385 each in quantity 100.

LP 3300 – Same rugged design and simplicity as the LP 3000 but operates at a speed of 300 lpm. Well suited for applications requiring medium speeds. The price for this unit is just $4,220 in quantity 100.

The LP 3000 and LP 3300 are also available in printer/plotter versions, the LP 3050 and LP 3350 respectively. These graphics versions of the Potter Printers perform high resolution digital x-y plotting under cpu control. The LP 3050 operates at a speed of 15,000 points per second. The LP 3350 plots at a speed of 32,000 points per second. Both of these units can print and plot simultaneously.



Potter Line Printers increase system reliability, reduce maintenance and build customer confidence. For more information on the complete line of Potter printers, magnetic tape units, disk drives and 96-column card equipment, write today to Potter Instrument Company, Inc., 532 Broad Hollow Road, Melville, N. Y. 11746 or phone (516) 694-9000.

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Quantor Responsible for Latest Move in COM History

By Mark Flomenhoft
Special to Computerworld

History was most recently made in the COM industry last May 25, when Charles Askanas, president of Quantor Corp., revealed the Quantor 100N Computer Output to Microfilm System.

With it Quantor added the concept of on-line film processing to the principle of COM recording. Thus, exposed film enters a compartment within the assembly cabinet and passes through a series of chemical baths supplied by four plastic jugs.

Twelve minutes after recording on film has begun, the first dry, processed film becomes available. No external plumbing of any kind is needed.

The purchase price of the 100N was put at $29,995, the lowest of the industry. Yet, it is neither this low price nor the internal processor separately that sets the 100N apart from the other on-line COM recorders, but the combination of both. Perhaps a third feature, a console film monitor, should be mentioned in this connection.

It enables the EDP manager to begin viewing computer output only 12 minutes after starting.

This capability overcomes at least partially one of the serious deficiencies of on-line COM recording, namely, the delay in access to eye-readable computer output and the resulting impossibility of interacting with the data processing system in any real-time sense. A business graphics capability provides still another useful function.

But is even a short delay of 12 minutes really tolerable in most computer rooms? This is another of those questions that lack a single answer. For some applications a brief wait is tolerable and for others it is not.

A potential solution gradually winning recognition today is the low-cost, interactive alphanumeric display terminal augmented by a hard copy printer.

A modest disk facility should expand the memory of the setup to whatever is needed. Actually, the interactive responsiveness of an electronic terminal outstrips that of any of its alternatives. Occasionally used now as an auxiliary in electromechanical printer configurations, the alphanumeric display should be even more beneficial to on-line COM systems.

Two other improvements of the 100N should be mentioned. One is its recourse to a 7 by 10 character matrix, which produces an excellent quality of printing. The second is its emulation of the IBM 3211 line printer as well as the IBM 1403 and 1443 printers.

Summarizing, the 100N operates with IBM System/360 and System/370 computers. Like the Memorex 1603 it employs a snap-in cassette that functions only with the Quantor system. A Quantor duplicator and a reader-reader/printer pair round out a fully integrated COM system.

It clearly is intended to compete head-on with the Memorex 1603. No marketing returns are available for discussion at this early stage, but the contest bears watching.

Flomenhoft is Associate Editor of Auerbach Graphic Processing Reports.

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The CDS-214 is a two-high unit that stores 466 megabits in half the floor space. It has a unique electromagnetic head-positioning system — without mechanical pawls, detents, or gears — that gives faster access time (65 msec compared to a competitor's 80 msec). All common logic is packaged on a common board, so the end result is one-third as many boards — and MTTR is reduced to a 1-hour maximum (compared to a competitor's 1.5 hours). And, an off-line checkout exerciser quickly isolates problems without tying up the controller.

Other features also make the CDS-214 "more than just equivalent to": a cylinder difference calculator that simplifies OEM controller design, a variety of index and sector generation electronics for variable or fixed formatting, and interface options for virtually any industry standard logic. So that your system can be more than "just equivalent to," we'll be happy to send you full details.

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Combinations Growing

Digitronics Represents Trend in Peripherals Firms

By E. Drake Lundell Jr.
CW Computer Industry Editor

SOUTHBORO, Mass. – Single-product companies won't be able to make it in the future and this will lead to further consolidations in the peripherals industry, according to Clifton Sink, president of the Digitronics Division of Digitronics.

In five years any viable firm in the business will have to have a revenue volume of at least $100 million to support the marketing and engineering expenses necessary to be successful in the field, Sink said at Nortec, a recent acquisition here.

Digitronics is following a group of other firms that are putting together a complete peripherals product line through acquisitions and internal development.

In the past year Tracor Data Systems and GT&E Information Services have been notably successful in acquiring compatible product lines in order to serve specific market areas.

Digitronics is smaller than either of these, however, and is planning to expand its revenues 10-fold in the next five years in order to reach the magic $100 million level.

The trend is definitely toward the big peripheral combinations, and firms with money and experience can take advantage of the present economic situation to put together integrated companies, Sink said.

Time Was Right

The time for acquisition has been ripe in the past year, he added, because many companies with technological capabilities have run into tight money situations. In addition, he said, investors as well as the industry and peripherals technology have matured in the past year.

In the past year Digitronics has set up Data Handling Co., magnetic tape, acquired Data Terminal Corp., paper tape and keyboards, acquired Nortec, small printers, and signed a licensing agreement with SYS Computer for its microprocessor.

Presently, Sink said, it is consolidating these actions, but is always on the lookout for good opportunities that might come up – especially in the disk drive area.

A strong position in the OEM market is a good base for any of the new combinations entering the end-user market place, Sink said, because the OEM sales can be used to help finance the leases necessary for end-user penetration.

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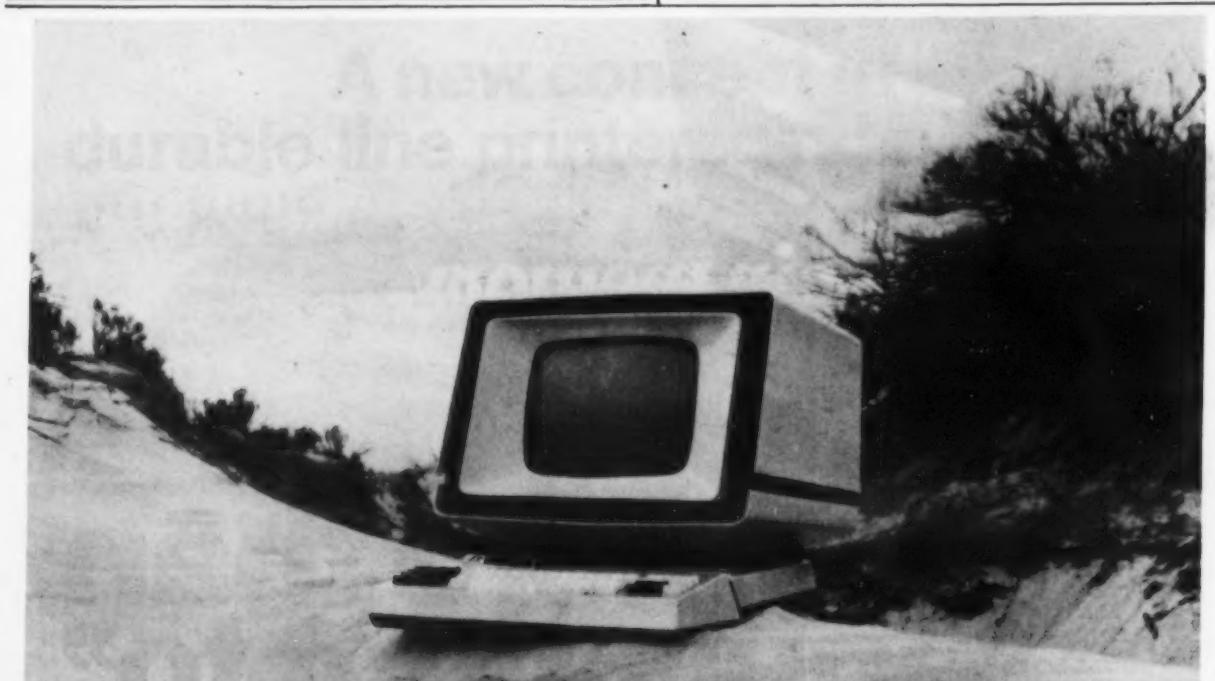

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OEM Buyers Warned That Minicomputer Purchases Not Easy

SAN FRANCISCO – "There is more to buying a minicomputer than just finding the cheapest one that meets the performance requirement," OEM manufacturers were told here recently.

"In a comprehensive evaluation – as opposed to a justification – the factors of reliability, maintainability, delivery, form of contract, and many other subjective criteria can and do influence the purchase decision," said Frank C. Milstead of Unitech, Inc.

At the same time, he told the OEMers, "Good management and good judgment must be applied to setting the bounds on the scope of the selection/evaluation effort.

"It is simply not economical to devote thousands of labor dollars to preparing a detailed purchase specification for one machine for one well-defined task. The machine may cost less than the effort to buy it."

The wide variety of purchase discounts and options from the mini makers have to be carefully studied so that the OEMer can get the best value, Milstead noted.

"In general," he said, "discount structures that have steep slopes imply certain restrictions on resale; more gradually sloped schedules generally permit a wider merchandising practice and longer term manufacturer involvement."

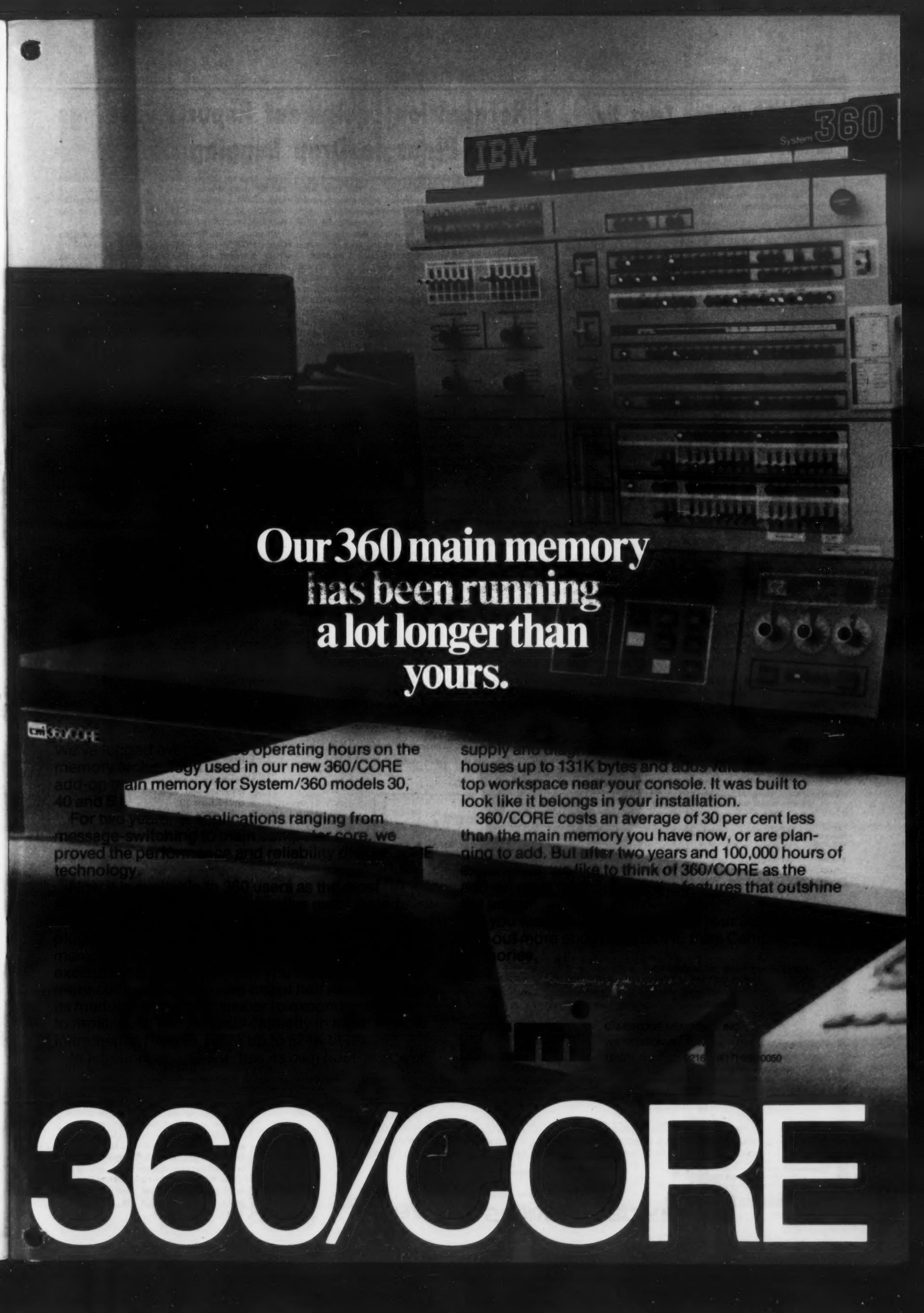
The long-term reliability, maintainability, and expandability factors of the systems have to be weighed in any purchase decision, he said, reminding the audience that "the OEM frequently has the capability to maintain his mini; his customer [the end user] does not."

Consequences Important

Because of this, Milstead said, "The consequences of machine error, the cost of down-time, the cost of spare parts, the ease of field modification, the availability and qualification of maintenance personnel, although peripheral to the selection process itself, are not peripheral to the on-going business venture."

Maintenance of the mini is also affected by the quality of documentation provided by the manufacturer, he noted, adding, "Good documentation costs money to produce, and again, the least expensive machine may not necessarily have the lowest ultimate cost."

Other elements in the decision to purchase a mini include human factors and packaging considerations, the availiability of users' groups, delivery schedules, and the marketing support that will be supplied by the mini maker to the OEM, Milstead added.



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DP Pushes Telex Up

TULSA, Okla. – Trading in Telex shares was halted most of last Thursday morning while investors digested some good news: revenues and net income were up dramatically, thanks to the progress of the computer products group.

Telex President S.J. Jatras said the company had also reached financing agreements with several banks, amounting to $58 million in revolving credit secured by Telex-owned computer peripherals.

The loans are contingent on sale of a new offering also announced last Thursday: $27,500,000 in subordinated debentures with warrants to purchase Telex Common Stock.

During the quarter ended June 30, the company delivered and installed computer peripheral equipment worth $25.5 million, about twice the value of similar shipments during the same period last year.

The sales and net profits of the communications group also helped, as a result of cost reductions from consolidation of this group.

Net income after taxes was $1.8 million, about 22% higher than the same period last year. Fully diluted earnings per share were 17 cents, compared with 14 cents for the same quarter in 1970. A delay in reporting first quarter results was caused by a government review of accounting procedures, especially on profits from sales to independent leasing companies.

Recognition Equipment Reports Earnings Rise; Plans to Drop Lagging Corp. S

DALLAS – While Recognition Equipment Inc. made a dramatic turnaround in the first nine months of 1971, its stepchild Corporation S could not keep pace, the firms reported recently.

REI also said it was trying to reduce its 49% interest in Corporation S, which was founded to operate OCR service bureaus and as such become a customer for REI-manufactured optical readers.

In the nine months ended July 31, REI earned $1.5 million (28 cents per share) on revenues of $27.8 million, compared to a loss of $8.5 million ($1.68 per share) on sales of almost $24 million in the same year-ago period.

For the third quarter the firm had a net of $447,000 (8 cents per share) on revenues of $9.1 million, compared with a loss of $2.6 million (51 cents per share) on a gross of $6.4 million in last year's third quarter.

While things appeared to get better for the parent, the child only sank deeper into the red for the same nine month period.

The loss at Corporation S rose to $4.7 million ($2.88 per share), including an extraordinary loss of $2.3 million ($1.39 per share), from the loss of $3.5 million ($2.14 per share) in the previous year's first three quarters.

Revenues from four wholly-owned Optimation Centers (OCR service bureaus) were $990,000 up from revenues of $892,000 garnered from six wholly-owned centers a year ago. The loss on wholly owned centers was $1.6 million in 1971, narrower than the $2.3 million loss reported last year.

The Corporation S decision to use the equity accounting method set forth in Accounting Principles Board Opinion 18 is reflected in the results for both 1971 and 1970, according to Donald W. Hartson, president.

He said that with the present backlog of signed contracts, monthly revenues by the end of calendar 1971 are expected to be more than double the mid-year level and the firm should be operating on a positive cash flow basis before the end of the first half of fiscal 1972.

While Hartson sees things getting better, apparently the parent corporation could not wait for results.

REI said, at the same time of the nine month statements, that it intended to reduce its ownership in Corporation S from around 49% to less than 20%.

Present plans call for the filing of a registration statement to permit distribution to REI stockholders of Corporation S stock, but the firm is also discussing with several other companies the possible sale of all or part of its interest in Corporation S.

REI shipments for the first nine months, covered in the statement, were $13.6 million and for the full fiscal year ending Oct. 31 are expected to be over $20 million, according to Herman L. Philipson, Jr., president. He said backlog on July 31 amounted to $17.9 million.

Century Data Results Boost Calcomp Gross, Net to Record Levels

ANAHEIM, Calif. – With a strong boost from its wholly-owned subsidiary Century Data Systems, California Computer Products, Inc. (Calcomp) reached record revenues and earnings in the fiscal year ended June 30.

Revenues jumped by 61% and net earnings were up 182% when compared with the previous year, the firm said. Net for the company was $2.3 million (98 cents per share) on revenues of $44.7 million, compared with earnings of $807,362 (35 cents per share) on revenues of $27.6 million.

While the firm does not break out the figures for its 100%-owned new subsidiary Century Data Systems, the disk drive maker is considered a strong contributor to both the sales and profit raises.

Mohawk Earnings Down Despite Records Set In Revenues, Leasing

HERKIMER, N.Y. – While the gross at Mohawk Data Sciences Corp. was setting new record levels, net drooped during the first quarter which ended on July 31.

For the three month period the firm earned $460,000 (8 cents per share) on record revenues of $26.4 million, compared with earnings of over $1.2 million (22 cents per share) on revenues of $24.5 million in the first quarter a year ago.

In the first quarter revenues from rental and services climbed to $14.3 million from the $11.2 million registered in the comparable year-ago period.

The firm was adversely affected by the build-up in marketing and development costs associated with its new System 2400, the firm said.

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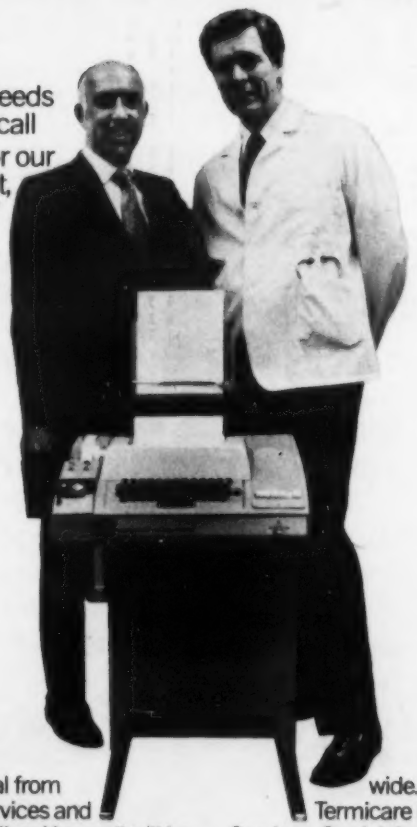

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TRADE*QUOTES

Computerworld Stock Trading Summary

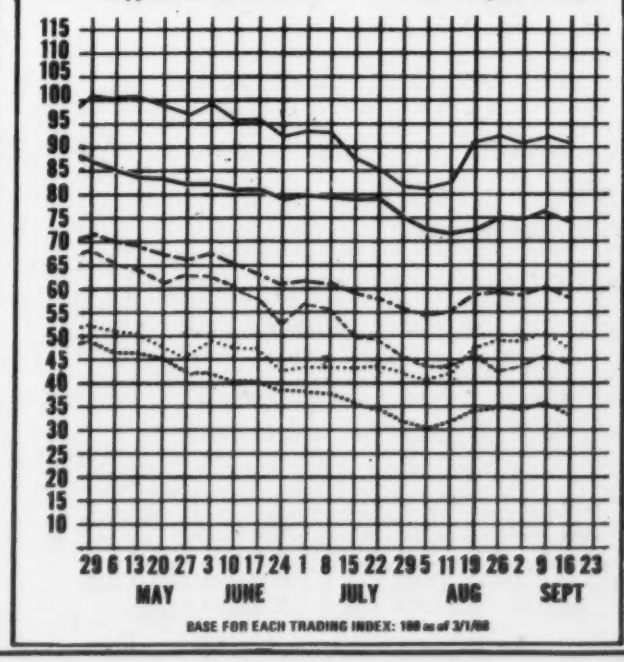
All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, SEPTEMBER 16, 1971

EXCH		1971 RANGE (1)	CLOSE SEP 16 1971	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 4	1 1/2	+ 1/4	+20.0
A	APPLIED DATA RES.	5- 13	6 7/8	- 1/2	-6.7
O	APPLIED LOGIC	1- 3	1/2	- 1/8	-20.0
O	ARIES	1- 2	7/8	+ 1/8	+16.6
N	AUTOMATIC DATA PROC	44- 65	59 1/2	-2	-3.2
O	AUTO SCIENCES	3- 8	2 7/8	- 3/4	-20.6
O	BOOTHE DATA SYS	1- 2	1 3/4	+ 7/8	+100.0
O	BRANDON APPLIED SYS	1- 1	1/4	- 1/8	-33.3
O	COMPUTER ENVIRON	1- 2	1/2	0	0.0
O	COMPUTER NETWORK	2- 11	4 1/2	0	0.0
O	COMPUTER PROPERTY	5- 11	5	0	0.0
N	COMPUTER SCIENCES	9- 17	8 5/8	- 3/8	-4.1
O	COMPUTER TASK GROUP	1- 3	1 1/2	0	0.0
O	COMPUTER USAGE	5- 16	7 5/8	- 1/8	-1.6
O	COMP AUTOMOT REPORTS	6- 13	9	- 1/2	-5.2
A	COMPUTING & SOFTWARE	24- 45	27 1/8	+ 1/8	+0.4
O	COMRESS	2- 4	2 1/8	0	0.0
O	COMSHARE	4- 8	4	+ 1/8	+3.2
O	CONSOL. ANAL. CENT.	1- 2	3/4	- 1/8	-14.2
O	DATA AUTOMATION	1- 4	1 3/8	0	0.0
O	DATA PACKAGING	6- 10	8 1/8	- 1/8	-1.5
O	DATAMATION SERVICE	1- 3	7/8	0	0.0
L	DATATAB	4- 10	7	- 1/4	-3.4
O	DIGITEK	1- 4	2 1/4	+ 7/8	+63.6
O	EDP RESOURCES	7- 16	8	-1	-11.1
A	ELECT COMP PROG	3- 7	3	- 1/8	-4.0
N	ELECTRONIC DATA SYS.	53- 85	60	-2 1/4	-3.6
O	INFORMATICS	7- 15	9 1/8	- 1/2	-5.1
A	ITEL	11- 23	11 1/2	- 3/4	-6.1
O	KEANE ASSOCIATES	4- 14	4 1/4	- 3/4	-15.0
O	KEYDATA CORP	8- 14	7 7/8	- 1/8	-1.5
A	MANAGEMENT DATA	7- 11	7 3/4	+ 1/4	+3.3
O	NATIONAL CSS INC	7- 14	9 1/4	+ 1/4	+2.7
O	NAT COMP ANALYSTS	1- 4	1 5/8	- 3/8	-18.7
O	NAT.COMP. SERV.	1- 4	3/4	- 1/8	-14.2
N	PLANNING RESEARCH	16- 26	16 5/8	- 3/8	-2.2
O	PROGRAMMING METHODS	18- 29	19 1/2	-1	-4.8
O	PROGRAMMING & SYS	2- 4	1 7/8	0	0.0
L	PROGRAMMING SCIENCES	1- 3	1/4	+ 1/8	+100.0
Q	SCIENTIFIC COMPUTERS	2- 3	2 3/4	+ 1/8	+4.7
O	SCIENTIFIC RESOURCES	1- 2	3/8	0	0.0
O	SOFTWARE SYSTEMS	1- 3	2	0	0.0
O	TBS COMPUTER CENTERS	4- 9	5 3/4	- 1/4	-4.1
O	TOLLEY INTL CORP	3- 8	7 1/8	+ 5/8	+9.6
O	UNITED DATA CENTER	2- 7	3 5/8	+ 1/2	+16.0
N	UNIVERSITY COMPUTING	21- 38	26 1/4	-1 1/8	-4.1
A	URS SYSTEMS	6- 11	6 7/8	+ 1/8	+1.8
O	U.S. TIME SHARING	1- 3	3/4	- 1/8	-14.2
O	VORTEX CORP	2- 5	5 1/4	+ 1/2	+10.5
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	24- 48	36 7/8	- 3/8	-1.0
O	ALPHANUMERIC	2- 6	2 3/8	+ 1/4	+11.7
N	AMPEX CORP	14- 25	16	- 3/4	-4.4
O	ASTRODATA	1- 2	1 5/8	+ 1/8	+8.3
O	ATLANTIC TECHNOLOGY	3- 8	3 3/4	0	0.0
A	BOLT,BERANEK & NEW	5- 8	5 3/4	0	0.0
N	BUNKER-RAMO	10- 17	10 1/8	- 5/8	-5.8
A	CALCOMP	19- 33	19 1/4	-1 5/8	-7.7
O	COGNITRONICS	3- 9	3 5/8	+ 5/8	+20.8
O	COLORADO INSTRUMENTS	2- 8	2 7/8	0	0.0
O	COMPUTER COMMUN.	6- 19	6 1/2	- 5/8	-8.7
A	COMPUTER EQUIPMENT	4- 7	3 3/4	- 1/8	-3.2
A	COMPUTEST	8- 20	8 1/8	-1	-10.9
O	CONSOL COMPUTER LTD.	4- 12	3	+ 1/2	+20.0
A	DATA PRODUCTS CORP	5- 10	5 1/2	- 5/8	-10.2
O	DATA TECHNOLOGY	3- 9	4	- 3/8	-8.5
O	DIGITRONICS	4- 8	4 1/8	- 3/8	-8.3
N	ELECTRONIC M & M	8- 16	9 7/8	-1	-9.1
O	FABRI-TEK	2- 4	2 7/8	+ 1/8	+4.5
O	FARRINGTON MFG	1- 3	1/8	0	0.0
O	FOTO-MEM INC	1- 6	3/4	- 1/8	-14.2
O	INFOREX INC	25- 49	26	-1 1/4	-4.5
O	INFORMATION DISPLAYS	5- 8	5 1/4	- 1/8	-2.3
O	MANAGEMENT ASSIST	1- 2	1	+ 1/4	+33.3
A	MARSHALL INDUSTRIES	14- 27	14	- 1/4	-1.7
A	MILGO ELECTRONICS	13- 26	14 1/4	- 3/8	-2.5
N	MOHAWK DATA SCI	22- 47	24 7/8	-2 1/2	-9.1
O	ON LINE SYSTEMS INC	7- 18	10	0	0.0
O	OPTICAL SCANNING	10- 18	10 3/8	- 7/8	-7.7
O	PHOTON	7- 12	8 3/4	+ 3/8	+4.4
O	PHOTO-MAGNETIC SYS.	1- 6	2	+ 1/4	+14.2
A	POTTER INSTRUMENT	13- 25	15 1/4	- 1/2	-3.1
O	PRECISION INST.	7- 16	11 1/2	- 1/2	-4.1
O	RECOGNITION EQUIP	12- 26	16 1/8	-1 1/4	-7.1
O	REDCOR CORP.	4- 9	4	- 5/8	-13.5
N	SANDERS ASSOCIATES	11- 22	10 7/8	- 7/8	-7.4
O	SCAN DATA	6- 15	12 5/8	- 1/2	-3.8
O	TALLY CORP.	8- 16	12 1/8	0	0.0
N	TELEX	13- 22	14 5/8	+ 3/4	+5.4
O	VIATRON	1- 4	1/8	- 1/8	-50.0
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	12- 19	12 5/8	-1 1/8	-8.1
O	BALTIMORE BUS FORMS	6- 10	7 3/4	+ 1/8	+1.6
A	BARRY WRIGHT	8- 13	7 3/4	- 3/4	-8.8
A	DATA DOCUMENTS	16- 29	17 1/4	- 1/8	-0.7
O	DUPLEX PRODUCTS INC	8- 10	10 1/8	0	0.0
N	ENNIS BUS.FORMS	6- 13	7 1/4	- 3/4	-9.3
O	GRAHAM MAGNETICS	9- 35	20 1/2	0	0.0
O	GRAPHIC CONTROLS	6- 15	13 1/8	+ 3/4	+6.0
N	MEMOREX	27- 78	35 1/2	-2 3/4	-7.1
N	3M COMPANY	96-123	120 3/8	0	0.0
O	MOORE BUS. FORMS	36- 42	38 3/4	-1 1/2	-3.7
N	NASHUA CORP	29- 47	45 3/4	+ 3/4	+1.6
O	REYNOLDS & REYNOLD	37- 62	61	+4	+7.0
O	STANDARD REGISTER	18- 23	19 3/8	0	0.0
O	TAB PRODUCTS CO	8- 17	11	-1	-8.3
N	UARCO	25- 34	25 7/8	+ 1/4	+0.9
A	WABASH MAGNETICS	6- 10	6 1/8	- 5/8	-9.2
N	WALLACE BUS FORMS	18- 26	21 3/8	+ 1/8	+0.5
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	105-140	130	-2 5/8	-1.9
N	COLLINS RADIO	12- 20	14 5/8	- 3/8	-2.5
N	CONTROL DATA CORP	48- 83	58 1/4	-2 3/4	-4.5
O	DATA GENERAL CORP	19- 64	64	+7 1/2	+13.2
N	DIGITAL EQUIPMENT	53- 85	80 1/2	0	0.0
N	ELECTRONIC ASSOC.	5- 9	6	- 3/8	-5.8
A	ELECTRONIC ENGINEER.	5- 10	9 1/8	0	0.0
N	FOXBORO	25- 46	42 7/8	-1 5/8	-3.6
O	GENERAL AUTOMATION	9- 26	13	-2 1/2	-16.1
N	GENERAL ELECTRIC	53-124	63 1/8	-1 5/8	-2.5
N	HEWLETT-PACKARD CO	30- 45	40 5/8	+1 3/4	+4.5
N	HONEYWELL INC	83-115	109 3/4	-1 1/8	-1.0
N	IBM	284-364	301	-5 3/8	-1.7
O	INTERDATA INC	6- 11	9 3/8	+ 7/8	+10.2
N	NCR	37- 49	41 1/8	-2 5/8	-6.0
N	RCA	26- 41	32 3/8	-1 1/8	-3.3
N	RAYTHEON CO	27- 46	37 7/8	- 5/8	-1.6
O	SCI. CONTROL CORP.	1- 2	5/8	- 1/8	-16.6
N	SPERRY RAND	25- 38	30 3/8	-1 3/8	-4.3
A	SYSTEMS ENG. LABS	8- 18	8 1/4	- 3/8	-4.3
N	VARIAN ASSOCIATES	13- 18	15 1/8	- 7/8	-5.4
N	VICTOR COMPTOMETER	14- 27	16 3/8	- 3/8	-2.2
N	WANG LABS.	29- 50	47	- 7/8	-1.8
N	XEROX CORP	85-121	116 3/8	-3 5/8	-2.8
	LEASING COMPANIES				
A	BOOTHE COMPUTER	13- 27	16 3/4	-2	-10.6
O	BRESNAHAN COMP.	2- 4	2 3/4	+ 1/8	+4.7
O	COMPUTER EXCHANGE	3- 9	3	+ 1/8	+4.3
A	COMPUTER INVSTRS GRP	8- 14	11 1/2	+1 1/4	+12.1
N	DATA PROC. F & G	11- 19	13 5/8	- 5/8	-4.3
O	DATRONIC RENTAL	2- 4	2 3/8	+ 1/8	+5.5
A	DCL INC	5- 13	8 3/8	- 1/2	-5.6
A	DEARBOR +STORM	24- 44	39 3/8	-2	-4.8
A	DPA, INC.	4- 9	8 3/8	- 1/2	-5.6
A	GRANITE MGT	7- 13	9 1/4	+ 1/2	+5.7
A	GREYHOUND COMPUTER	7- 11	8 1/2	-1	-10.5
N	LEASCO CORP	16- 26	23 1/4	-1 1/2	-6.0
O	LECTRO MGT INC	2- 5	3 1/4	- 5/8	-16.1
O	LMC DATA, INC.	1- 1	1	- 1/8	-11.1
O	NCC INDUSTRIES	3- 8	6 3/4	- 1/8	-1.8
A	ROCKWOOD COMPUTER	4- 9	4 1/4	- 1/4	-5.5
O	SYSTEMS CAPITAL	3- 7	5 1/8	- 1/2	-8.8
N	U.S. LEASING	16- 39	37 1/2	+ 1/2	+1.3

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Earnings Reports

APPLIED LOGIC
Nine Months Ended June 30

	1971	a1970
Shr Loss	$.90	$2.15
Revenue	1,936,511	2,100,122
Loss	1,867,638	4,360,425

a-Adjusted to be consistent with recent charges in accounting procedures charging all development expenses against current operations.

ATLANTIC TECHNOLOGY
Six Months Ended June 30

	1971	1970
Shr Ernd (Loss)	$.25	$(.39)
Revenue	1,135,481	69,948
Earnings (Loss)	278,392	(432,222)

BROOKS INTERNATIONAL
Year Ended May 31

	1971	1970
aShr Ernd (Loss)	$.28	$(.03)
Revenue	1,710,167	921,943
Spec Items	b49,617	d(177,145)
Earnings (Loss)	201,306	(191,371)

a-Based on income before special items. b-Tax benefit from utilization of prior year operating losses. d-Write-off of deferred charges, net of deferred income tax reduction of $26,890.

COMPUTER DIMENSIONS
Three Months Ended June 30

	1971	a1970
bShr Ernd	$.03	$.01
Revenue	2,029,919	1,345,993
Spec Cred	c44,000	.....
Earnings	87,175	17,033

a-Restated. b-Based on income before special credit. c-Reduction in income taxes resulting from net operating loss carryforward.

COMPUTING & SOFTWARE
Nine Months Ended July 31

	1971	a1970
Shr Ernd	$.91	$.88
Revenue	68,228,000	64,282,000
Earnings	5,057,000	4,758,000

a-Restated to include companies acquired subsequently on a pooling-of-interests basis.

E.B.S. DATA PROCESSING
Nine Months Ended June 30

	1971	1970
Shr Ernd	$.26	$.07
Revenue	6,469,753	6,465,500
Earnings	631,068	172,900

EDP RESOURCES
Year Ended April 30

	1971	1970
Shr Ernd	$.31	$.17
Revenue	13,358,684	11,224,233
Earnings	236,057	124,784

INFORMATICS
Three Months Ended June 26

	1971	1970
Shr Ernd	$.03	$.04
Revenue	5,105,000	4,730,000
Earnings	48,000	56,000

INTERNATIONAL TIMESHARING
Year Ended May 31

	1971	1970
aShr Ernd (Loss)	$(.03)	$(.16)
Revenue	2,471,858	1,603,660
Spec Cred	.....	b800,000
Earnings (Loss)	(54,698)	96,318

a-Based on income before special credit. b-Includes $387,000 income tax credit and $413,000 from sale of software.

SCIENTIFIC COMPUTERS
Year Ended June 30

	1971	1970
Shr Ernd	$.16	$.11
Revenue	3,495,900	3,444,721
Earnings	128,792	87,638

AMERICAN USED COMPUTER CORP.
FOR SALE
IBM 1401 CARD, TAPE & DISK
DEC PDP8, 8I & 8L PERIPHERALS/MODULES
POTTER PRINTERS & MAG. TAPES
CDC DISK DRIVES & MAG. TAPES
HIS H 200, DDP516 & GE435
RCA 3301 & 301/PERIPHERALS
UNIVAC 1004, 1005 & 418
XDS 920
SANDERS 720 DISPLAYS
CCI DISPLAY TERMINALS
DATA GENERAL NOVA
VERMONT DRUMS
SEND FOR FREE BUY/SELL GUIDE
extracted from "All About Used Computers"
CALL 617/227-8634
15 School St., Boston, Ma. 02108

During the past 12 months, a significant number of time-sharing users have changed from SBC, GE and others to Leasco Response.

WHY?

Read the facts from users at:

a major petroleum company
(changed to Leasco Response on July 2, 1970)

one of the Midwest's largest banks
(changed to Leasco Response on Aug. 3, 1970)

one of the nation's largest pharmaceutical manufacturers
(changed to Leasco Response on December 7, 1970)

a leading educational products firm
(changed to Leasco Response on January 14, 1971)

Here's what they said about how they select time-sharing vendors:

"Most important to us is the compatibility of the system and the helpfulness of branch service people."

"For me, it is a question of responsiveness and reliability of the system."

"What counts, ultimately, is how much it costs to do my job."

Then they said this about their selection of Leasco Response:

"Leasco Response compatibility enables us to change with minimum risk and negligible costs."

"Leasco Response response time on our problem was dramatically superior."

"Leasco Response people seem to be really eager about meeting our requirements."

"Leasco Response price and performance were 25% better, as demonstrated by our benchmarks."

And they added this about their experience since changing to Leasco Response:

"Leasco Response delivered as promised — both in price and performance."

"Leasco Response systems enabled our process design application to run in 50 minutes . . . vs. 90 minutes on our former service."

"Leasco Response branch support, programming performance and expert consultation through their Technical Information Center resulted in increased productivity by our staff."

"Leasco Response reliability has been better than with our previous service."

What about your company?

Are you using a time-sharing service that's not doing enough for you? Or doing it too slowly? And for money that could be buying you considerably better service?

If you suspect that your present time-sharing service may not be as fast, reliable, helpful or cost-efficient as it could be, take a moment now to mail the coupon below.

It will bring you complete information about LEASCO RESPONSE — the time-sharing service you should get to know. No obligation, of course.

For immediate information, call collect to Bill Mahony, Director of Marketing

301-657-1840

Leasco Response Incorporated
5401 Westbard Avenue, Washington, D.C. 20016

Please send me more information about Leasco Response, without cost or obligation on my part.

Name.....

Company.....

Address.....

City.....

State.....Zip.....

Offices in principal cities LRI-2